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## IMPROVEMENT IN OSCILLATING ENGINES.

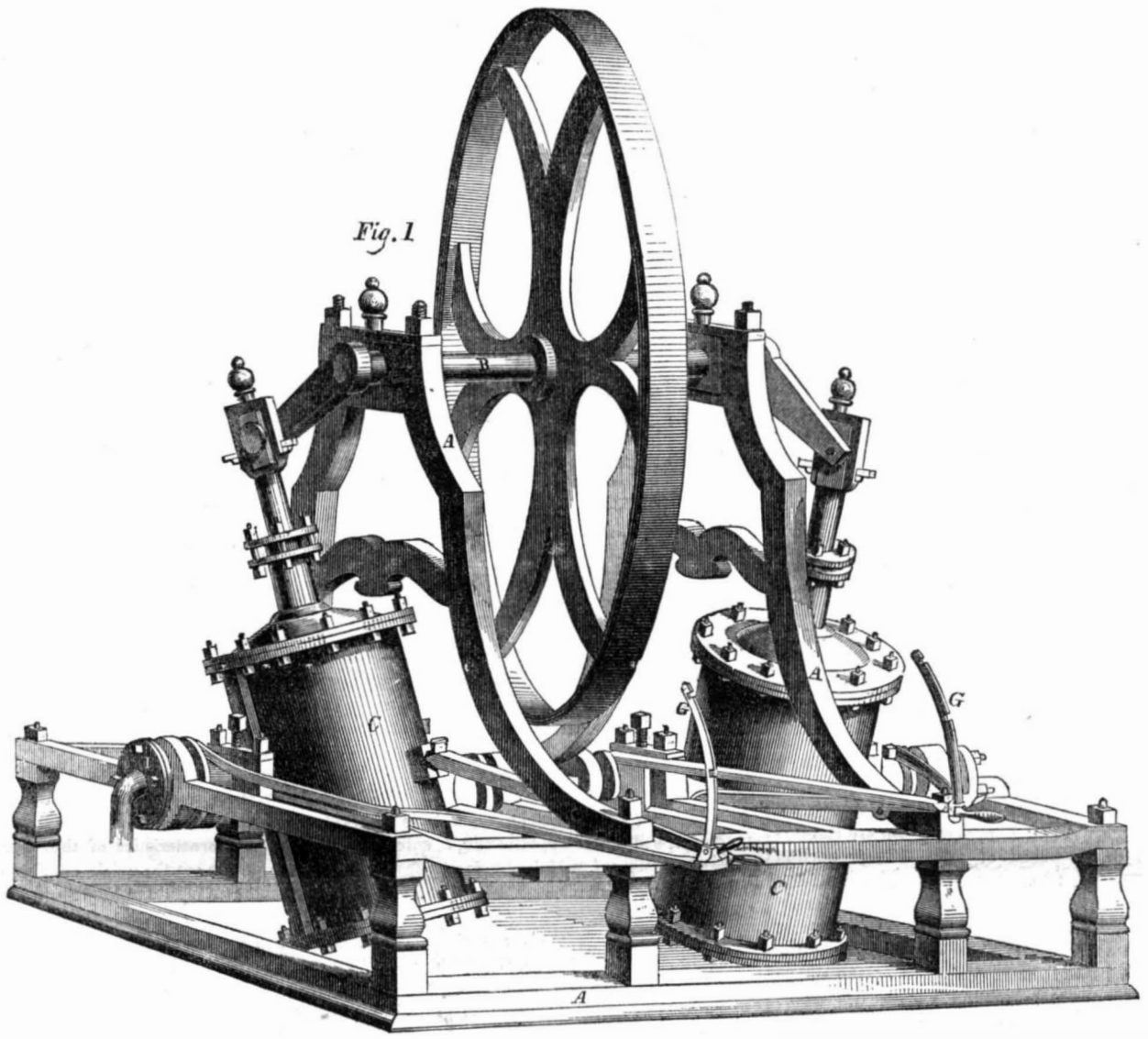

Fig. 1

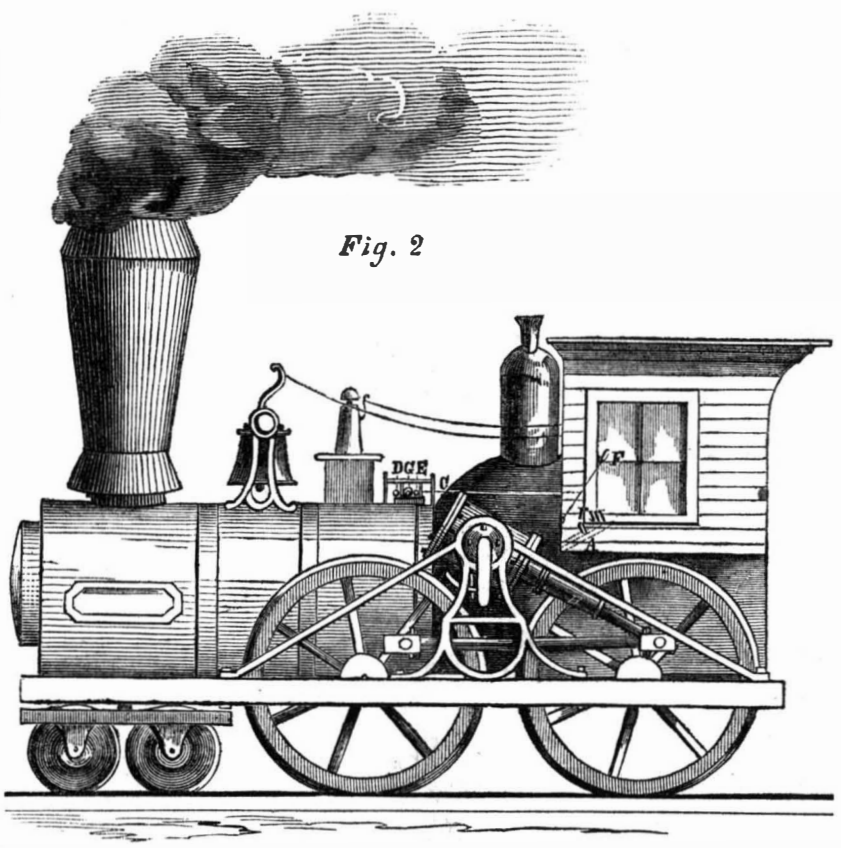

Fig. 2

### Improvement in Oscillating Engines.

The accompanying engravings represent improvements in oscillating engines, for which a patent was granted to Geo. F. Wood, of Ulysses, N. Y., on the 23rd of January last.

Figure 1 exhibits a stationary double oscillating engine; figure 2 exhibits an oscillating locomotive engine with a new attachment; figure 3 is a side elevation of the engine showing the improvement with most of the framing taken away; figure 4 is a vertical section of the same; figure 5 and 6 are diagrams of the faces of the valves illustrative of induction and eduction of the steam, and the reversal of the engine.

The improvement relates to a new arrangement and mode of operating the valves for effecting the introduction and eduction of the steam, and reversing the engine.

On figure 1 A represents the framing; B the main or crank shaft, and C C the cylinders; G G will be explained in describing figures 3 and 4.

There are two modes of reversing the locomotive, figure 2. The first is by attaching the rod and handle, A, to the reversing lever, and the light rod and handle, K, to the catch, *o*. The next is by changing the current of steam, and admitting it into the eduction valve by the following means: C is a small cylinder of 2½ or 3 inches bore, into each end of which the steam enters first from the boiler. The ports D, and E, conveying the steam to and from opposite sides of each cylinder, may be alternately converted into induction and eduction ports by a movement of the lever, F, in the engine room, which as it now stands makes D an induction and E an eduction communicating with the general eduction, G. But if the two pistons be pushed as far to the other end of the cylinder, D becomes an eduction and communicates with G, and E becomes an induction port. This is done by the use of one lever,—the engine reversed, and the steam cut off from the cylinders. D D, figs. 3 and 4, are two frames which contain the bearings, *b b*, of the cylinder trunnions, which are cast with the cylinder, C. The cylinder trunnions have conical recesses or seats bored or turned out truly within them to receive the conical faces of the induction and eduction valves, I and E, these valves are bored out at their backs a little tapering, to receive the tapered nozzles of the induction and eduction pipes, I′ and E′. These pipes pass through suitable openings in the standards of the engine frame, and are provided outside the standards with flanches, *e e*, to receive bolts, *f f*, which are screwed into the standards and furnished with nuts, *g g*, for the purpose of adjusting the nozzles and valves, the valves being kept in their places by the nozzles, and held in such a manner as to turn freely, but at the same time to fit steam-tight both around the nozzles and in the conical seats in the cylinder trunnions. Both valves are precisely alike in construction, each having three ports, 1, 2, 3, arranged as shown, equi-distant and within the same circles; and the seats in the trunnions have each two precisely similar ports, *p p′*, arranged opposite to each other, leading to opposite ends of the cylinder. Figure 5 exhibits the arrangement of the ports of the induction, and figure 6 those of the eduction valves, both being supposed to be seen looking from the induction. The position shown is when the crank is on either center, and the ports, *p* and *p′*, of both sides of the cylinder closed. Suppose it on the top center, the oscillation of the cylinder in the direction to the left, figure 5, will bring the port, 1, of the induction valve, opposite upper part, *p*, of the induction side, and the port, *p′*, of the eduction valve opposite the port 3, of the eduction side of the cylinder, and thus take steam above and exhaust from below the piston. Or suppose it to be on the bottom center, the oscillation in the opposite direction will give steam through the opening 2, to the lower induction port, *p′*, and exhaust through the upper eduction port, *p*, and the opening, 1, of the eduction valve. The changing of the position of the induction and eduction valves by turning them one-sixth of a revolution on the nozzles of the pipes will effect the reversal of the engine. This will be understood by supposing figure 6 to be the induction, and figure 5 the eduction valves, when it will be seen that it requires an oscillation to the right to admit the steam above and exhaust from below the piston, as was before done by an oscillation in that direction. The change of position of the valves to reverse the engine is effected by a forked lever, F, which is bolted to two flanches, *f f*, one on each of the valves, so that it will move both the same distance. This lever is furnished with a stud, *g*, which fits in a slot in an arc, G, which is described from the axis of oscillation of the cylinder, and which, as far as the reversing of the engine is concerned, may be stationary, though it has a slight movement for another purpose to be hereinafter explained. The lever is also furnished with a spring, catch, *h*, which will either hold the lever at the upper part of the arc, as shown in figure 3, by catching on the top of the ark, or may hold it at the lower part by catching in a notch, *i*, near the bottom. The distance between the upper and lower of said positions is just sufficient to move the valves for reversal. If a notch is provided anywhere near the middle of the arc the engine may be stopped by bringing the catch into the said notch.—[*See next page.*]

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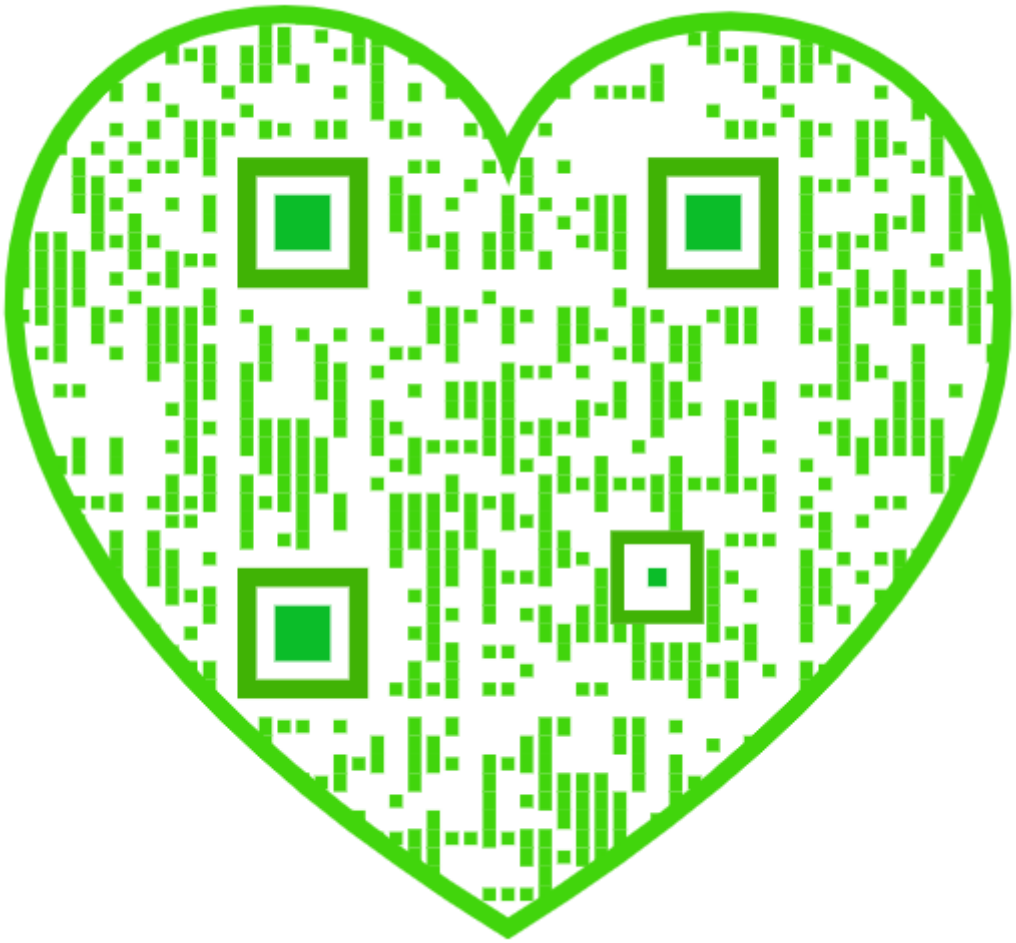


### The Art of Dyeing—No. 13.

COTTON, BLUE AND RED MIXED COLORS—DARK LOGWOOD PURPLE—This color is a mixed blue and red—binary—the former predominating, but in olden time we find crimson sometimes called purple, which is a color with the red ray predominant. Common purples on cotton are prepared by steeping ten pounds of cotton in sumac liquor, (3 lbs. boiled or scalded) for twelve hours, then taken out, wrung or squeezed, and shaken out, then handled for five turns in a spirit tub of nitro-muriate of tin at 3° Twad., then steeped for an hour, taken out, wrung, well washed, wrung, and shaken out again, and then handled smartly for half an hour in a tub of strong logwood liquor at the rate of eight pounds to the ten of cotton. This makes a deep purple. It is not a fast color.

LIGHT LOGWOOD PURPLE—This is performed in the same way as the last, only the cotton is bleached, gets only 2 lbs. of sumach to the 10 lbs. cotton, and 3 lbs. of logwood. These colors receive a *raising*, as it is termed, that it is, when the cotton gets seven turns in the logwood it is lifted, and about half a wine glass of the muriate of tin stirred among the liquor, the goods entered again, getting four handlings or turns, then lifted, washed and wrung for drying.

SUGAR OF LEAD ALTERNATE—If sugar of lead is employed for raising instead of the tin spirits, the color is thrown on the blue shade.

REDDISH PURPLE—This shade is given by the same process as the others, excepting that the dye liquor is composed of half logwood and half peachwood.

A deep reddish purple, sometimes called crimson, is colored by giving four pounds of logwood and four of peachwood, all the rest of the process being the same.

PLUM PURPLE—This color is dyed in what is termed the plum tub. This is made by boiling logwood until it stands at least 6° Twad., then adding nitro-muriate of tin spirits. About 1¼ ounces of tin are employed for one pound of acid. The proportion of acid is 1 lb. nitric to 5 muriatic (hydrochloric.) Some dyers, however, use muriatic alone, and feed in as much tin as the acid will dissolve. For every two pounds of the best logwood used, one pound of the spirits is employed in making up the tub which should stand three days before it is used. Most dyers throw a mysterious air around the preparation of this tub or vat. Owing to the spirits being so strong, the working of goods in it is very severe on the hands.

The way to work the goods is to take some of the strong liquor out of the vat (which is generally a large hogshead) and place it in a small tub, adding some fresh liquor for every new bundle or parcel.

The color produced by this method is very rich, but great care is required in handling the goods, as they are liable to work uneven. By using one-half peachwood instead of all logwood, the color will exhibit more of the red ray. By running the goods through warm water after being dyed, they are thrown on the blue shade.

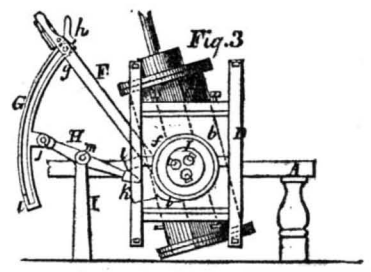
LAVENDER—This is a light purple on the blue shade, and comprehends *puce* and *lilac* shades. Dye the goods a blue in the indigo vat first (to the depth of shade desired) then wash them well, wring or squeeze, shake out, and give ten turns in the plum purple liquor. It must be observed that the old plum liquor is always preserved. This lavender with an indigo blue bottom, is a very beautiful color.

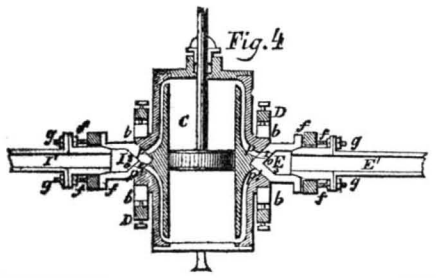
The *puce* shade is dyed by giving a very light blue bottom (to do which the indigo vat must be sharp and in good order) and a light purple dip afterwards; then wash them, Lilac is done in the same manner, only the spirit tub must be made of half peachwood and half logwood. For these light shades—purple, puce, lilac, &c—the goods should all be bleached.

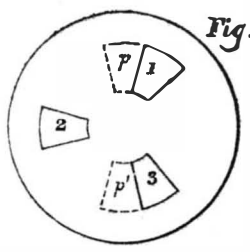
ALKANET ROOT LILAC—This is the most beautiful color, with the exception of Turkey red, that is dyed on cotton. The root grows in the Levant. Its coloring matter is but slightly soluble in water, but is rendered so by the mordants applied to the goods which are designed to be colored by it. The goods are first bleached, then run through a strong solution of soap, then wrung up and dried in the stove room. About one pound of good soap is sufficient for ten pounds of cotton yarn. Next day the goods are run through a saponacious liquor, made with olive oil and pearl ash, dissolved in warm water at the rate of one quart of oil to one pound of ash. These are stirred up together and diluted with milk-warm water, until its strength is reduced to 3° Twad. The goods are padded together, in this in hanks, by hand, wrung up, and dried in the stove room. Two of such liquors are sufficient. The goods are then washed by running them through three tubs of clean milk-warm water. They are then dried again, and are fit to receive the mordant. This mordant is a strong solution of alum, about 4° Twad. It is best to run them twice through this liquor, to provide against unevenness. They are then dried, washed with three waters, wrung up, and are fit for receiving the dye wood. It requires a great quantity of this root to give a full color; no less than two pounds of it for every pound of cotton. It is ground to powder, and put into a copper kettle of cold water, and the goods entered. The heat is then increased, and the liquor brought gradually to boil in about three-fourths of an hour; the boiling is continued for half an hour, when the goods will have acquired a deep rich lilac color. If the shade inclines to the reddish tint, it can be blued by adding a small quantity of sugar of lead in solution.

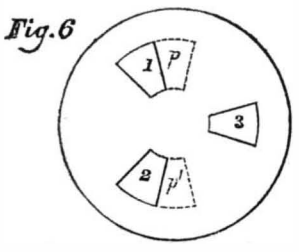
Although this color is very beautiful, it is expensive, and far from being as permanent as Turkey red, inasmuch as light soon affects it, and reduces its brilliant tone from a violet hue to a rusty drab.

## OSCILLATING ENGINES.




*[Concluded from First Page.]*

The arc, G, is attached by a pin, *j*, to one end of a lever, H, whose fulcrum, *m*, is in a standard, I, and whose opposite end, *k*, enters a notch in a piece, *l*, which stands out from the front of the cylinder. The oscillation of the cylinder gives a vibrating motion to the lever, H, and through it gives a rising and falling movement to the arc, G, which gives an oscillating movement to the lever, F, and to the valves, E and I, the valves always moving in the opposite direction to the cylinder. This movement is for the purpose of opening the ports in the cylinder quickly by causing the ports in the valves to move towards them to meet them.

The peculiar characteristics of the operation of this engine are the quick opening of the ports and the simple and easy reversal.

Oscillating engines are very simple and compact, and are fast extending in use. We believe they have not yet been applied to locomotives, but they have toall other purposes.

More information may be obtained by letter addressed to Mr. Wood at Jacksonville, Tompkins Co., N. Y.

### Self-Loading Cart.

The claim on another page of the patent for a self-loading cart, granted this week to Dr. Ze Butt, of Lincolnton, N. C., embraces some very peculiar features. The wheels are hung on short axles, the box has no head board, and the body of the cart is hung on a vibrating crank shaft turning in boxes in the frame, and is placed near the back of the frame, so as to allow of dumping the load easily. It is by thus arranging the body of the cart that the adjustment of the front end, or the whole of the cart body can be effected, and the load dumped backward, with dispatch and ease. A scraper is also secured to the front end of the bottom of the cart body, which scoops up loose soil, and deposits it in the cart box, as the cart is moving forward, thus rendering it a most excellent improvement for street wagons in grading, and also for grading railways.

### Watchmakers' Lathes.

The claims of the patent of James M. Bottum, of this city, published on another page, embraces an improvement in watchmakers' lathes, whereby such a lathe is rendered more adaptable—because more flexible—to enable the wheels to adapt themselves exactly to the form of the work. A polishing wheel spindle is so secured and applied to the lathe as to allow the polishing wheel to be adjusted to polish any turned surface, either the periphery of cylindrical or conical work, or the faces of shoulders, whether square or bevelled. By the improvement, the faces of the shoulders of journals and pivots may be polished right into the corners in the best manner without any difficulty, by any workman of moderate capacity, and so can other work, which is now performed only by highly skilled workmen.

### Air Heating Furnace.

The patent granted to Jas. H. Sutton, of Honesdale, Pa., this week, for an improved air heating furnace, has for its object preventing heating of the air in the cellar or vault in which the furnace is placed, so as to employ the whole of the heat of the furnace in heating the air that passes through pipes described in the claim, and conducting it to one or more different apartments of the building, to heat them. The furnace is constructed so that the cold air for combustion passes down between an outside casing and a second one, then into a space between the latter and the fire chamber, and into the fire. The air to be warmed and conveyed to apartments, for respiration and maintaining a comfortable temperature, passes cold and pure through a tube into the furnace, and is heated and conveyed upwards into a chamber, and from thence conveyed by pipes, or a pipe, to any place where it is wanted.

### New Washing Machine.

Although a great number of patents have been obtained for washing machines, it will be observed by the claim of E. Morgan, on another page, that another improvement has been added to a very long list of them. The washing box contains an upper and lower washboard, which are self-adjustable. The upper one is suspended, and is a reciprocating rubber with two motions, whereby it accommodates itself to the quantity of clothes in the machine; a very necessary requirement. By gently adjusted springs, the rubber can wash the finest articles without the least danger of destroying their texture or tearing them.

### The Emperor of Russia Dead.

By the latest news from Europe, the astounding intelligence has been received that Nicholas, Emperor of all the Russias, is dead. He died at St. Petersburgh on the morning of the 2nd March, of pulmonary apoplexy. What the effect of this will be on the present war in Europe, no one, at present, can tell. He appeared, a few weeks ago, to be the most important personage in the world—the very axis on which rotated all the great events of the European nations, consequently, the death of no other person, by common methods of reasoning, can affect public affairs so much.

The heir to his throne is his son, Alexander II, aged 37 years, an able and wise prince, it is said. We shall soon see whether Nicholas was the sole will of Russia, or he, though a despot, but the instrument of the nation's will.

### English and American Intelligencer.

Messrs. Gardissal and Tolhausen have commenced the publication of a weekly paper in Paris bearing the above title. It is printed in English and French, and will be found very useful for all those who cannot read French, and who desire to get information respecting the Great Exhibition. It also gives a list of the American and English exhibitors. The names of forty American exhibitors, through S. H. Wales, Commissioner of this State, are given. A directory is given of the Protestant and English churches in Paris; and all the public places of resort, such as the Academy des Sciences, &c., &c.

### Improved Caster for Billiard Tables.

MESSRS. EDITORS—In your closing remarks as appended to my "Improved Caster for Billiard Tables," you say, "This improvement might be profitably applied to writing tables and school desks." This is a mistake. It was not designed, nor can it be applied at all usefully to such purposes, as no perfect level is therein required. It is strictly intended to be applied to billiard or bagatelle tables in which the utmost accuracy is necessary. For such uses I wish the invention to stand upon its own merits.

F. L. ROUX, Patentee.

Charleston, S. C., March 13th, 1855.

[We were not mistaken in the remarks we made, although Mr. Roux disclaims any intention of the application of his invention to any other use than Billiard Tables. Desks fitted with feet capable of being easily raised and lowered to suit persons of different hights, or by raising to stand and write, and lowering to sit and write, must indeed be very convenient; any person can see this.

### Glass Globes Unfit for Fish.

In the first place, the fish require abundance of air. Now, scarcely any other shape than a globular one contains so much water with so little exposure to the air. Fish, too, require shade, not when we choose to give it to them, but when they feel the want of it; and it need scarcely be observed that all day long a glass globe is in a blaze of light. Still more, the water in a globe must be daily changed, consequently the fish must be lifted out, either by the hand or a small net, and it is utterly impossible, however careful we may be, to handle or net these delicate little creatures without injuring them, at one time or another.

### Gold Mining in Wales.

Two years ago there was a great ado made in England about such an abundance of gold being found in Wales, and it was said that England had an abundance of that metal within her own borders. Thousands upon thousands were expended on machines to extract the yellow metal from the Welsh gossan. Well, it turns out that they have been truly gossaned, for the Welsh gold has turned out to be gammon.

Extensive fires, we are sorry to hear, have been prevailing in the woods of Georgia and South Carolina.

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For the Scientific American.

### The Ratio of the Diameter to its Circumference is Exact.

This proposition has been denied by some, especially by Sir Isaac Newton, who alleged that there was no ratio between the diameter and circumference of a circle. Barrows, his instructor and predecessor, supposed there was none. This is incorrect, as the following observations and demonstration will clearly show:—

It can be proved that any number whatever can be made to assume the form of 10 (i. e. one principal measure in a system of notation and no (0 zero) more) and when this number is the denominator of a common fraction, the numerator can be exactly divided by the denominator, and the fraction be made to assume the decimal form. Having premised this we would state the following proposition:—

That any two lines whatever may be divided into such a number of equal parts that one of the parts shall exactly measure both lines.

Let A———B and C———D be the two lines, of which A B is the greater, and let C D be divided into a number of equal parts, one of which is *a*; then if *a* does not exactly measure A B, there will be a remainder, *r*, less than *a*, and will be expressed in terms of *a* by $r \div a$, which is a vulgar or common fraction. But any common or vulgar fraction may be assume the decimal or entire form, or be reduced to a complete expression, the unit of which expression will exactly measure the equal part, *a*, and consequently will exactly measure the two lines, A B, C D, separately. Hence there is an exact ratio between any two laws considered with reference to each other. And since the diameter and circumference of a circle is equal to two straight lines of the same length, it follows that there is an exact ratio between them. This ratio is expressible by the common method of notation, for it can be a ratio of units, as is manifest from the preceding demonstration, so that in no sense was Newton correct in stating that it did not exist.

The difficulty respecting this subject we apprehend to consist in the restrictions which mathematicians inadvertently impose in respect to the measure by which the ratio shall be determined, namely, that after the units it shall decrease by tenths, hundredths, thousandths, tenths of thousandths, &c., of its length, from which it is manifest that it may or may not coincide with the circumference finally, but this does not indicate that a different measure may not coincide with it, or that there are not many measures that will, and it has already been shown that there is, that must do it, so that the attainment of this ratio may not be disposed of, for it is far from being a mathematical impossibility.

THOS. H. McLEOD.

Middlebury, Vt., Feb. 26th, 1855.

### The Sphygmograph or Pulse Writer.

In No. 26, present Volume SCIENTIFIC AMERICAN, under "Notes of foreign scientific matters," Prof. Vierordt's (correct name) machine to record the beating of the pulse is noticed. Allow me to state that there has been a machine for the same purpose, invented, made, and experimented with, in this country, which is much more accurate and ingenious than the German one. The invention of this instrument called Sphygmograph i. e. Pulse-writer, was occasioned by the wish of Dr. C. Hering, of Philadelphia, to have a machine for such a purpose. It was invented by Mr. E F. Hilgard, U. S. Coast Survey, and made in Washington about a year ago. It is an electro-magnetic machine, recording on the same strip of paper the time and the number of beats of the pulse; it is, in fact, a Morse's recording telegraph instrument, with two levers, two magnets, two batteries, and a clock. The current of one battery is broken by the stroke of the pendulum of a clock, each stroke making a dot. The current of the other battery is broken by the pulse. To a splint fastened to the arm of the person whose pulse is to be recorded, a lever is attached, one end of which rests on the pulse, so that each beat of the pulse raises with the lever a projecting piece of platinum from another insulated piece of platinum; to each of these pieces of platinum one end of the wire from the battery is attached, and each beat of the pulse breaks the circuit and makes a dot. The operators of this double telegraph being, in one instance a clock, in the other the pulse recording on the same paper, thus:

. . . . . time.
. . . . . pulse.

In an experiment, the pendulum made 72 strokes a minute, therefore 12 strokes are equal to 10 seconds, during the same time the pulse beats 10 times, making 60 beats per minute. The number of dots per ¼, ½, or 1 minute, are transcribed to a paper horizontally and vertically ruled, the time on the vertical and the pulse on the horizontal lines, showing at a glance the state of the pulse. During last fall the subscriber made with this instrument a series of experiments to ascertain the action of different articles of food and drugs on the system, and how they affected the pulse. Alcohol (1 oz. to 3 oz. of water) raised the pulse at first considerably above the normal number, then it lowered it for a much longer period, the line showing the rising was never a straight one, but always up and down, wave-like, and so was the falling pulse.

Dr. C. Hering had this instrument made for merely scientific investigations, and as soon as a sufficient number of experiments shall have been made, the results will be published. Th instrument may be seen at the office of its proprietors in Philadelphia.

A. ZUMBROCK., M. D.

Baltimore, March 10th, 1855.

### Rifle Shooting.

MESSRS. EDITORS.—In reading over your answers to correspondents in No. 25, present Volume of your paper, I notice an answer to a Texas correspondent, in which you state that "the Minie bullet would be an advantage in the common rifle." From this statement I beg leave to differ; that is, so far as the common acceptation of the term "advantage" is concerned, when used in connection with rifle shooting among us. The principal advantage which our rifle makers strive to obtain for the rifles of their respective manufacture, is as to *accuracy*, and not so much as to distance. Now it is a fact well known to rifle makers, but one which it is not always for their interest to acknowledge, that a rifle which is loaded at the breech cannot be made to throw its balls with that precision which is attained by the muzzle-loading rifle, when constructed upon the right principle. The reason is this; it is impossible to get exactly the same explosive force at every charge, hence the bullets are "slugged" more at one time than another, and consequently fall short of, or over-reach the mark. Again, the ball does not always receive the force of the powder in an equal proportion on all sides, which causes it to be driven deeper into the groove of the rifle on one side than the other; this of course would cause it to go wide of the mark. The Minie bullet acts the same in principle as the common bullet, in a breech loading rifle; the Minie rifle has no joint through which a part of the gas can escape, as is the case with the breech-loading rifle, hence its longer range. I venture the assertion that no rifle has ever been made that will shoot with such accuracy as the muzzle-loading rifle, especially when a patent muzzle is used.

G. L BAILEY.

Portland, Me., March 15, 1855.

[The advantage of a Minie over a common bullet in a common rifle, is simply in rapid loading—not for accuracy, respecting which, we believe our correspondent is right.

### Depth of the American Lakes.

It has hitherto been asserted that Lake Huron was 860 feet deep, but it has lately been ascertained by U. S. Coast Survey that it is only 420 feet deep. Lake Erie is from 60 to 70 feet deep; Lake Ontario 452 feet—as low as most parts of the bottom of the Gulf of St. Lawrence. All the Lakes cover an area of 43,040,000 acres.

### Properties of the Electric Spark.

The following is the condensed abstract of a recent lecture by Faraday, before the Royal Society in London. It will be found interesting in facts, not generally known, while at the same time it is clear on a very important subject, lightning conductors:—

The heat of the electric spark is intense, though the momentary duration of its effects prevents its heat-giving power from being felt to its full extent. The inflammation of ether and the explosion of gunpowder were shown as illustrative of the heat contained in the electric spark, and the effect of momentary action in diminishing the heating power was exemplified by sending an uninterrupted charge through some loose gunpowder, and then repeating the experiment with a wet string introduced as part of the conducting circuit. In the first arrangement, when the spark passed instantaneously, the gunpowder was scattered and not exploded, but when the resistance of the wet string prolonged the discharge, the gunpowder was ignited. The electric spark is sometimes applied in blasting rocks as well as voltaic electricity, and voltaic agency, is, for general blasting purposes, very convenient. The effects of the electric discharge are only perceived when resistance is offered to the passage of electricity, and several experiments were exhibited in which it was shown that a charge which passed without producing any apparent effect, when a thick wire formed the circuit, was sufficient to deflagrate interposed pieces of thin wire and gold leaf, that were not adequate to conduct the same quantity freely. The ingenious contrivance of Prof. Wheatstone for measuring the duration of an electric spark was exemplified by lighting a disk, colored in stripes, and revolving rapidly in the dark, with a succession of electric sparks. Though the colors were mingled together, and invisible when seen by ordinary light, the momentary light of the electric spark exhibited each color distinctly, and the disk for the instant appeared stationary. By increasing the velocity till the colors became confused, even when seen by the spark, an approximation is attained to the duration of the light; and in this manner Mr. Swaine, of Edinburgh, proved that the electric spark lasts only the hundred thousandth part of a second. A flash of lightning is of equally short duration, and every object in motion, when seen at night by the glare of lightning, appears to be stationary. The apparent duration of an electric spark is about one-tenth of a second, because an impression once made on the retina is retained for that time, though the object that produced it, as in the case of lightning, is no longer present.

Another remarkable property in the electric spark is the action it exerts on the light-storing power of phosphate of lime. That substance, together with some others, possesses the power of absorbing light in a latent state, which is given out on the application of heat in the dark. This light, when once taken from the phosphate of lime, can be restored to it by the electric spark, and by that means alone. Prof. Faraday concluded by explaining and illustrating the influence of the non-conducting property of the air on the length of the spark. By partially exhausting a glass tube a spark passed through a much greater space, and when the exhaustion of the air was more complete, and the resistance thus removed, the electricity from the prime conductor of the machine passed in continuous flashes, imitating the effects of the aurora borealis.

### Clock Statistics.

Connecticut is called "the land of wooden clocks," from the fact that she is more extensively engaged in the manufacture of clocks than any other State in the country. She has $1,000,000 invested, employs 1,279 workmen, and manufactures 794,000 clocks each year. Bristol has 14 factories, 410 hands, and produces 201,000 finished clocks annually; Plymouth has 3 factories, 175 hands, and manufactures 70,000 clocks; Ansonia has 2 factories, 140 operatives, and makes 102,000 clocks; Winsted manufactures 30,000 clocks, has 1 factory, and employs 40 hands, while Southampton, with 2 factories and 45 hands, makes 40,000; and New Haven, with 3 factories and 405 hands, annually produces 374,000 clocks. One of the New Haven factories is owned by Chauncy Jerome, the Mayor, and pays out nearly $10,000 per month in wages.

### On Gum Mezquite.

The following article by Campbell Morfit, M. D., of the University of Maryland, Md., and published in Silliman's *Journal* for this month, will be interesting to many of our readers:—

Gum mezquite, known synonymously as *Muckeet*, *Mezqueet*, and *Musquit*, and recently presented to public notice by Dr. G. G. Shumard, U. S. Army, is said to be the product of a tree flourishing extensively in the high and dry regions of the plains of Western Texas, New Mexico, and the adjacent Indian Territory. The facility with which it may be obtained in large quantities, and its very probable prospective value as an article of commerce, give it an interest that led me to a chemical examination, which I have caused to be made in my laboratory by one of my students, Mr. Frederick W. Alexander.

It is a spontaneous semi-fluid exudation concreting by exposure into tears and lumps of variable size and and form. One sample, which was a part of that brought in by Dr. Shumard, and obtained directly from the U. S. Bureau of Indian Affairs, consisted of small irregular pieces and rounded balls about the size of a hazel nut, semi-transparent, and shading in color from a lemon white to dark amber. When broken, the fracture faces were brilliant; and the gum was easily reduced under the pestle to a dull white powder. One of the balls was enveloped with an outer pellicle of gum of about 1-16th of an inch in thickness.

These proportions approximate very closely to those obtained from gums Senegal and Arabic by Guerin and Mulder. The general appearance, too, of the gum, is similar to that of gum Senegal, and the dark inferior qualities of gum Arabic. In chemical properties, also, it is allied to them; being insoluble in absolute alcohol, partially soluble in common alcohol, and readily forming with hot or cold water a very adhesive mucilage. It is in fine, a true gum, and promises, in its physical and chemical behavior, much of the advantage, expected by its discoverer, as an economical substitute for gum arabic or Senegal.

The specific gravity of the gum was 1·5, but this determination may possibly admit of correction upon purer samples than were disposable for the experiment.

Its proximate composition was found to be,

| | |
|---|---|
| Water, - - - - - - - - | 11·640 |
| Foreign Matters, - - - - | 0·236 |
| Bassorin, - - - - - - - | 0·206 |
| Arabin, - - - - - - - - | 84·967 |
| Ash, - - - - - - - - - | 3·000 |
| | 100·049 |

Cerasin was also sought for, but not found. The ash was estimated by burning a given quantity in an atmosphere of oxygen and weighing the residue.

The ultimate analysis, made also by effecting combustion of the carefully dried gum in oxygen gas, yielded, in two separate experiments, the following numbers:

| | | |
|---|---|---|
| Carbon, - - | 43·63 | 43·10 |
| Hydrogen, - | 6·11 | 6·50 |
| Oxygen, - | 47,26 | 47·40 |
| Ash, - - - | 3·00 | 3·00 |
| | 100·00 | 100·00 |

### A California Lamprey.

Dr. Ayres presented a specimen of a lamprey at the meeting of the California Academy of Sciences, Feb. 5. It is the only one yet discovered in that country. Its length was only 4¾ inches.

By the late news from Europe, we learn that old Joseph Hume, M. P., is dead. He arose from being a poor boy to be one of the most respected and best informed men in England.

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# New Inventions.

### Improved Sleigh.

The sleigh of W. H. Guiwits, of Rogersville, N. Y., for which a patent has been issued this week, is constructed with front runners, which have an independent motion, so that they have a perfect freedom to turn like wheeled vehicles, without wrenching them, as in the common way of making sleighs. The grand object is to prevent the wrenching of the runners in turning, something very desirable, and the means employed to do this are ingenious. It is not stated so in the claim—but as the *forward* runners are mentioned, it will be understood that the improvement refers to double runners connected with a reach, on which placed a single box or sleigh body.

### Gas Regulators.

The patent granted this week to J. W Hoard, of Providence, R. I., has for its object the maintenance of a uniform pressure of the gas on the burners at all times. The invert ed floating cup mentioned in the claim to control the opening of the regulating valve is simply combined with an air spring—the pressure of the atmosphere on one side, opposed to the pressure of the gas on the other—for increasing and diminishing the resistance of the cup to the pressure of the gas, whatever that may be in the pipe, or by whatsoever means produced.

### Improved Arrangement of School Desks.

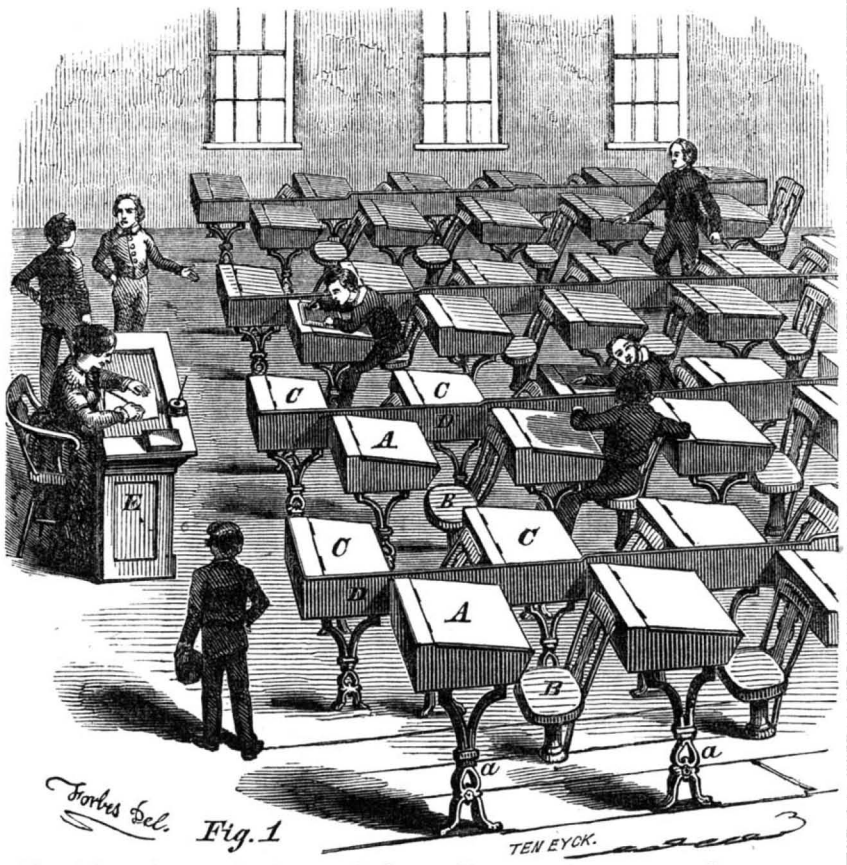
The annexed engraving is a perspective view of an improved arrangement of desks in school-rooms, for which a patent was granted to Virgil Woodcock, of Swanzey, N. H., on the 7th inst., and the claim of which was published in our list of last week. It embraces "the diagonal arrangement of the seats and desks," as here exhibited. The usual method of arranging desks in school-rooms, is to place them in independent rows, with an aisle between each double row. By this new arrangement two rows of desks are combined together, with a separating partition between them; or with a standard at each end, the partition may be dispensed with. Two rows of desks, A A and C C, are shown, connected to each partition board, D. The teacher's desk is represented at E; B are the seats of the scholars at the desks. *a a* are the desk standards. Each scholar's desk is arranged opposite the seat space of the opposite scholar, thus completely separating them, and preventing playing and whispering, excepting by the agonizing method of wriggling their heads, as shown by the attempt of the two little fellows in the middle of the room. An aisle is left between each double row of desks.

The engraving represents the plan so plainly that very little more is required to be said respecting it.

By this arrangement as many scholars can be seated at single desks as at double desks, and they will only occupy the same floor room. There is also a gain over single desks as arranged in the common way in schools, by seating forty-eight scholars with these desks in the same space as thirty-six are commonly seated. The desks and chairs are arranged diagonally on the floor, so that no one scholar can see the face of another without one of the two being at right or left half face.—When the school is called to procession all can rise at once, and step into files in the aisles without coming in contact with one another. Scholars are more directly under view of the teacher, and can therefore be kept in better order.

This improved arrangement of desks and seats has been introduced into the "high school" at Bellows Falls, Vt., of which P. B. Goodsell is principal, from whom we have a communication on the subject. The house is large, containing 235 of these desks. He says, "the beauty, simplicity, and utility of this plan is apparent at first view. After a fair trial, I am convinced that a school of one hundred scholars can be as easily controlled in a room thus arranged, as sixty by the old methods of single or double desks.—The improved desks of Mr. Woodcock greatly diminish the labor of the teacher." The inventor has named his plan "the United States School-room."

## IMPROVED ARRANGEMENT OF SCHOOL DESKS.




More information may be obtained by letter addressed to the patentee at Swansey.

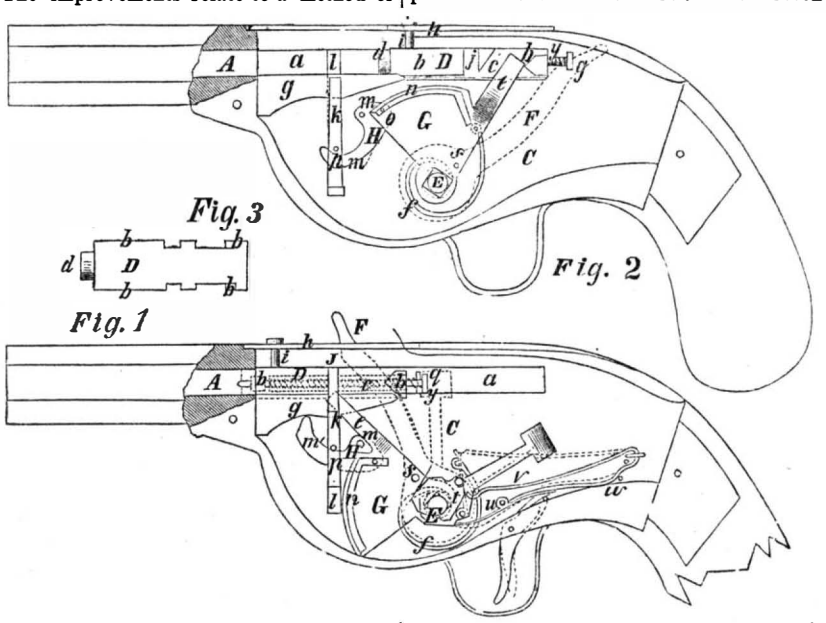
## NEWTON'S BREECH-LOADING FIRE-ARMS.

The annexed engravings represent an improvement in fire-arms, for which a patent was granted to Abner N. Newton of Richmond, Ind., on the 27th June, 1854.

Fig. 1 is a side view of a pistol, having one side of the shank, which unites the barrel with the stock removed, in order to show the block and the mechanism by which the breech pin and cock are operated. Fig. 2 is a similar view, showing only the mechanism for operating the breech-pin, and in a different position to fig. 1. Fig. 3 is a top view of the breech pin. Similar letters refer to like parts.

The improvements relate to a method of operating a sliding breech pin, and in the arrangement and means of operating the cock, whereby the repetition of charging and firing can be performed with great rapidity and ease.

The barrel, A, is united with the stock by means of a hollow iron shank made in two parts or sides, C, of which one is capable of being readily detached, for the purpose of exposing the interior, and in each part or side of this shank is a groove, *a*, to receive a tongue, *b*, on either side of the sliding breech pin, D, and direct the movements of the said pin in a line with the barrel. The breech




pin has a part, *d*, capable of fitting closely in the back part of the chamber, and when it, *d*, is in the chamber, the part behind it fits to the rear of the chamber with a shoulder. It has a recess, *c*, in either side, to receive one of the prongs of a forked lever, *e e*, which is firmly attached to an arbor, E, which corresponds with a tumbler shaft of an ordinary fire arm, and protrudes through the side, C, of the shank far enough to receive, outside the shank, the thumb lever, F, which is firmly attached to the arbor, for the purpose of drawing back the breech pin to load the piece. The arbor, E, has a spring, *f*, attached to it, and to the side, C, of the shank in such a way that after the breech pin has been drawn back by the action of the forked lever, *e e*, and the lever, F, has been released, it will be returned to its place (as shown in fig. 1,) by the action of the spring. The charge, which is employed in the form of a cartridge, is placed upon a shelf, *g*, which is fixed close in the rear of the chamber, and is left uncovered when the breech pin is drawn back. The breech pin is covered when in place, as shown in fig. 1, by a plate, *h*, which is attached to it by a screw pin, *i*, so as to slide back and forth with it in grooves provided to receive it. The breech pin has two other recesses, *j j*, one on each side, to receive the two sides of the lock pieces, *k k*, which is of forked form, and slides in upright grooves, *l l*, in the sides, C, of the shank. This lock piece is drawn far enough to set free the breech pin when it is desired to be drawn back, and is raised to lock it when thrown forward, by the action of a slotted plate, G, attached to, or forming a portion of the forked lever, *e e*, under a small lever, H, which swings on a fixed fulcrum, *m*. The greater portion of the slot, *n*, in the plate, G, is in the form of an arc described from the center, E, but a short piece at the back part is straight. One arm of the lever, H, is furnished with a pin, *o*, which plays freely in the slot, and its other arm, *m'*, which is curved, plays between the bottom of the lock piece and a transverse pin, *p*, attached to the same. When the drawing back of the thumb lever commences, the action of the straight part of the slot upon the pin is such as to raise it, and throw down the part which acts upon the lock piece, thus throwing down the latter and unlocking the breech pin. When the arc formed part of the slot receives the pin, no further motion of the lock piece takes place, but the breech pin is kept unlocked. In drawing back the thumb lever the straight part of the slot must act before the drawing back of the breech pin commences. When the thumb lever is set free to allow the breech pin to be thrown forward, the straight part of the slot does not act till the breech pin is in place. The two sides, *k k*, of the lock piece are made of slightly tapering form, that they may act as wedges in driving home the breech pin. The cartridge to be employed contains some detonating composition, and is exploded by being pierced with a needle in the rear.—The needle, *q*, is fitted to slide freely through the breech, and is held back by a spring, *y*, so that its point does not protrude through the breech pin until the head at its back end is struck by the cock. The cock, I, is like the cock of other guns, except that it is attached directly to the tumbler, and is within the shank instead of outside the piece. It is fitted to work loosely on the arbor, E, and is cocked by the drawing back of the thumb lever preparatory to the loading of the piece, being thrown back simultaneously with the forked lever, *e e*, by means of a pin, *s*, which is inserted transversely through the lower part of the forked lever, and which comes in contact with the tumbler. The tumbler is represented as composed of two plates, *t t*, which both fit the shaft and receive between them the hub of the forked lever, *e e*, and plate, G. The cock is held back by a catch, *u*, and feather spring, *w*, in the usual way, which are set free by the trigger, J, and it is made to strike when set free, by a main spring, *r*, like that commonly employed.

The loading and discharging of the piece is performed in the following manner:—The piece is held in the right hand, in the usual way, and the thumb lever, F, which occupies the place usually occupied by the cock, is drawn back until the tongues, *b b*, on the sliding breech pin arrive at the back of the groove, *a a*, as shown in fig. 2, and the lever can move no further. During the early part of the position shown in fig. 1, the straight part of the slot, *u*, in the plate, G, is in operation on the stud, *o*, is drawing down the locking pieces, *k k*, to unlock the sliding breech pin, and by the time that is free, the prongs of the forked lever, *e e*, have reached the back of the recesses, *c c*, and will commence moving back the breech pin. The cock at the time the drawing back of the thumb lever commences, is in the position represented by dotted lines, fig. 1, but about the same time as the breech pin commences moving, the pin, *s*, comes in contact with the tumbler, *t t*, and commences throwing back the cock, which is secured by the falling in of the catch, *u*, before the breech pin stops. The cartridge is placed on the shelf, *g*, with the left hand, and the thumb lever then set free, when the spring, *f*, quickly drives forward the breech pin, and drives the charge into the barrel. The piece is now ready to be discharged, which is done by pulling the trigger in the ordinary way, and setting free the hammer to strike and drive the needle forward.

A gun constructed on this plan, may be loaded and fired from twenty to thirty times in a minute. It is more free, than a gun of ordinary construction, from any liability to accidental explosion of the charge, for if the thumb lever is accidentally caught and moved while the gun is cocked, it does not affect the cock in any way.

More information may be obtained by letter addressed to him, at Richmond, Wayne Co., Ind.

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# Scientific American.

NEW YORK, MARCH 24, 1855.


### Who is the Inventor of Combined Stame and Steam in Engines.

Paul R. Hodge, Engineer, in a communication to the London *Mining Journal* of February 10th, claims to be the first inventor of combined stame and steam in engines, for which the Messrs. Wethered, of Baltimore, have obtained a patent—illustrated on page 45, this volume SCIENTIFIC AMERICAN. He asserts that he obtained a patent in England for this combination, three years before the patent was issued to Messrs. Wethered. He constructed such an engine for the Great Exhibition in 1851, which is now in operation at Leicester. A patent it seems has recent ly been taken out in England, on the basis of Messrs. Wethered being the original inventors; but Paul R. Hodge denies that any person has power to use it, or grant licences but himself. His plan, he says, is to take steam from a drum on the boiler, through a pipe, bringing it down and around the furnace four times, and carrying it through one of the tubes of the boiler, from thence into a wrought iron jacket around the cylinder, and then into the steam chest, where it is mixed with ordinary steam, conveyed by another pipe from the boiler down in front of the fire box.

It appears to us that Mr. Paul Rapsey Hodge claims more than he is entitled to, in his letter to the *Mining Journal*. Whatever may be the merits or demerits of using combined stame and steam, or the credit which the inventor of its use should receive, is not the question with us at present, but, "who was the original inventor?" We believe it was not Paul R. Hodge. He obtained a patent in England on the 3rd of July, 1850, the one which he claims embraces the principle covered in the American and foreign patents of Messrs. Wethered, but we cannot, by reading a copy of that patent of Mr. Hodge, get a clear idea that the use of common and surcharged steam (stame) combined, formed any part of his improvements. His object appears to be the use of surcharged steam in a jacket, as he states in his letter; the common steam which he states to have mixed with the surcharged steam, was not *common*, but surcharged steam also, for, instead of conducting it directly from the boiler to the cylinder, to mix it with the stame, the steam pipe made several circumvolutions in the smoke box, for the purpose, as stated in the published abstract of his patent, "to be further charged with heat (in plain language, made into stame) before entering the cylinder." We consider that Mr. Paul R. Hodge is not entitled to any credit for his method of using steam; he merely adopted a modification of Mr. Frost's plan, in the use of stame, which was published in the SCIENTIFIC AMERICAN as long ago as 1849.

### British Patent Office—Formalism.

"After having paid £60 sterling to *secure* my patent for explosive appliances. The Lord High Chancellor of England refuses to sign it, on the grounds that it was *one* day too late. This delay of one day was caused by the final specification being detained in Dublin, on Sunday, the 2nd of April, no mail leaving Dublin on that day for Cork. The letter of Mr. William Johnson, my patent agent, was dated the 31st March, and the Glasgow post-mark was the same date; I therefore received his letter only on the 3rd April. All this was set forth in my petition, yet the Chancellor refused to sign the patent. I ask, could such a thing as this be enacted in America? J. NORTON."

[The above is a clause in a letter to us from Capt. Norton, an old Peninsular officer, who has devoted a great part of his life, with much success, to improvements in fire arms and various kinds of explosive appliances. It shows how much thick-skulled nonsense there is in the British system, from beginning to end. Such an evil could not be enacted in America, or if committed, relief would soon come in some way, when the public was made to understand the justice of the applicant's demands. Capt. Norton made a number of very useful inventions in shot and shells, and recommended them to the attention of the head men in the British army more than ten years ago, but they were passed over unheeded, and now when danger threatens them in the Crimea, they are beginning to rub their eyes and inquire about their utility. In 1826 he gave one of his rifle percussion shells for cannons to Col. R. Egerton to show Lord Fitzroy Somerset (now Lord Raglan,) when that personage replied, "All inventions in the improvement of arms tend to place the weak on a level with the strong; we are the strong, and therefore do not encourage improvements."

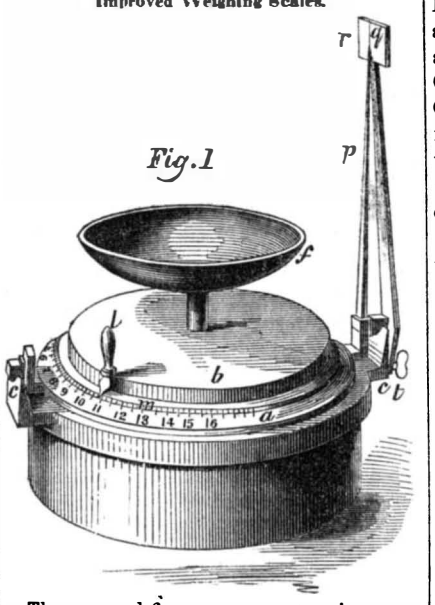
No better evidence could be afforded of the incapacity of Lord Raglan, to conduct the war in the Crimea, than the above piece of mud-headed enterprise. He has found out by this time who are the strong. The man who despises inventions and improvements is sure to run himself out very quickly in the present age: Lord Raglan himself is an evidence of this. He was a despiser of improvements, thus showing that he had no mental grasp, nor the quality of mind to plan, or else he would always have been a friend to inventors and an advocate of improvements. The consequence is, England has lost a fine army, and Lord Raglan, who at one time (untried) possessed quite a respectable military reputation, has not a *rag* of it left,—he has stripped himself of every stitch of military character.

### The Gulf Stream.

It is believed by many that the waters of the Gulf Stream are nothing more or less than the waters of the river *Amazon*. This great father of waters is bedded more than 1,000 miles immediately under the equator, and all its tributary streams, for many thousand miles, are constantly pouring their hot water into this mighty reservoir of water. As these waters are gathered under the burning sun of the equator, they are extremely warm; far more so than the waters of the *Atlantic* under the equator. The great body of heated water shoots out into the *Atlantic* more than a hundred miles, in the face of the eternal trade winds.

The *Amazon* is sixty miles wide; after being bedded in its irresistible course, it curves off to the left, and scuds off before the strong trade winds till out of their reach. Driven along with great force, it takes its course round the great bay formed between the two continents of North and South America.—Dashing along the northern coast of South America, and passing to the leeward of the West India Islands, it leaves the shore of Cuba and proceeds along the shores of Florida, the capes of Virginia, and the south coast of North America, and passing along the shores of Newfoundland, ends its mission among the icebergs which float out of the northern ocean. Cut off the Gulf Stream, and it would not be many years before the North *Atlantic* would be filled with icebergs, and the port of New York would cease to be the center of American commerce. Before the course of the Gulf Stream was known, ships from Europe to New York, in winter, used to sail first to Charleston, S. C., then coast it down to the *Hudson*. The voyage used to occupy them from six to eight months. The Nantucket fishermen were the first to discover the course of the Gulf Stream, and while English captains were taking six months to reach New York, they used to make the run sometimes in one month. Vessels running north of this stream in winter get their sails and rigging frozen so that it is scarcely possible to make any headway. By running into the Stream they thaw out, for the water is always warm, and is known by this, and its intense deep blue color. It is provided as a reservoir of heat by the Great Governor of Worlds, to accomplish his grand purposes. It is the influence of this Stream which renders the climate of Britain so genial. Were it diverted to break upon the coasts of Spain only, the Island of Britain would soon become a bleak, cold, and inhospitable region, with a climate as cold and a winter as long as Labrador; and Erin would cease to be named the Emerald Isle, for her fields would be covered with snow during eight months in the year, instead of green herbage. It appears from geological evidences, that the Gulf Stream, at one period, did not break upon the shores of Britain, and it was then as cold as Iceland. Upon such harmonies of nature's operations, directed by an All-Wise Creator, do men and nations depend.

### Improved Weighing Scales.

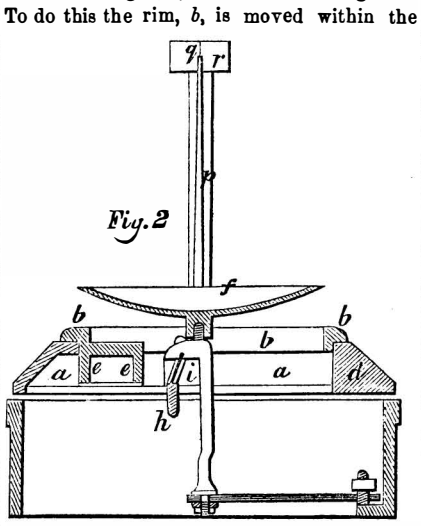



The annexed figures represent an improvement in weighing scales, for which a patent was granted to John L. McPherson, of New Vienna, Clinton Co., Ohio, on the 16th of January last.

Figure 1 is a perspective, and figure 2 is a central vertical section view perpendicular to the axis of suspension. Similar letters refer to like parts.

The invention consists in constructing the scale of two concentric circular rims, the exterior supported by knife edges, and the inner rim movable. the dish resting on a bar running across the outer rim on one side of its axis of suspension, the balance being produced when weighing, by so moving the inner rim that a weight attached to it shall approach a weight fastened to the outer rim on the opposite side of the axis of suspension, a pointer attached to the movable rim indicating on a graduated arc of the outer rim the weight upon the disk.

In the figures *a* and *b* are the rims, supported on the knife edges, *c*, and so loaded by weights, *d* and *e*, as to be accurately balanced when the weights are on opposite sides of the axis of suspension. The dish, *f*, is supported on a knife edge, *i*, of a bar, *h*, running across the outer rim, *a*, on the side of the axis of suspension nearest the weight, *e*. Any substance placed upon the dish will, it is evident, add to the weight on that side of the axis of suspension, and for the restoration of the equilibrium, render it necessary to move the weight, *e*, towards the weight *d*. To do this the rim, *b*, is moved within the




rim, *u*, by means of the knob, *l*, until the pointer, *p*, rests on the mark, *q*, of the indicator, *r*; the scale will then be again balanced on the knife edges, *c*, and the weight of the article in the dish indicated by the division of the graduated arc, *m*, upon which the pointer, *u*, rests. Should the scale rest on a surface having a slight inclination, the indicator, *r*, can be so adjusted that the pointer, *p*, will rest on the mark, *q*, when the empty scale is balanced, by loosening the screw, *t*, and moving the indicator laterally.

More information respecting this beautiful improvement may be obtained by letter addressed to the patentee at New Vienna.

### Niagara Suspension Bridge.

The new suspension bridge over the *Niagara* river, erected by John E. Roebling, C. E., of New Jersey, is at length completed and opened for trains. It is of great strength, and forms the connecting link between the Great Western Railroad in Canada, and the Central New York Railroad. The first locomotive passed over on the 8th instant; it weighed 23 tuns. The depression at the center was 3½ inches, but no vibration was produced. "On the 9th the experiments were repeated with two other engines, making trips at the rate of 8 miles per hour. One locomotive, weighing 34 tuns, with a car full of passengers, passed over at the same speed; the depression at the center was 5½ inches." The strongest gales of wind have no effect upon it. The length of span from center to center, is 822 feet; hight of towers above the rock on the American side, 88 feet; hight on the Canada side, 78 feet; hight of floor of railway, 60 feet; number of wire cables, 4; diameter of lash cable, 10 inches; number of No. 9 wire in each cable, 3,659; aggregate strength of cables, 12,400 tuns; weight of superstructure, 750 tuns; weight of superstructure and maximum loads, 1,250 tuns; maximum weight of cable and stay will support 7,300 tuns.

### The Olive in California.

We perceive in the *Pacific*, of San Francisco, that at a meeting of the California Academy of Natural Sciences, held February the 5th, Dr. Kellogg exhibited a drawing and specimen of the olive. The specimens were brought by Col. D. Ransom, of the U. S. Survey, from San Fernando. It is well acclimated in California at all the old mission stations. This tree, as stated by Dr. Kellogg, is thrifty on the sea coast, declivities, and valleys, where the soil is free from stagnant moisture, and when the debris is *flat gravel*. It grows to the hight of 20 feet, with a trunk of eight or ten inches diameter, and forms a picturesque ornament to avenues and plantations. Its branches are graceful; its foliage ever-green; its wood excellent; it lives to a great age, and can be propogated by cuttings.

We hope the people of California will enter into the cultivation of this tree with zeal. Its oil is the finest in the world. It cannot be obtained pure from abroad; all that is sold here is adulterated. We hope California will soon be able to furnish a supply.

### To our Book Publishers.

Our publishers of foreign books commit a grave error in not giving the dates of foreign publications. It often happens that these works are referred to as authority, and the date then becomes as essential as the matter. When a work published in London is republished here five or six years afterwards, with only the date of its American publication, it cannot be used nor referred to as authority in a question of dates. We have had considerable experience in this line, and we must tell our publishers that it is not to their advantage to print an old book with a new date, to make it appear a perfectly new publication.

### Weather in England.

The severity of winter was felt in England during the first week of February, the same period of its greatest severity in this country. The various parks presented more the appearance of as many Fairs in honor of some great national event, than the usually quiet promenades. The ice was literally covered with human beings, sliding and skating. The *Thames*, above Richmond, was completely frozen over, and no craft, even of the smallest description, could either pass up or down. Nearly all the steam vessels plying above London Bridge were compelled to be laid up.

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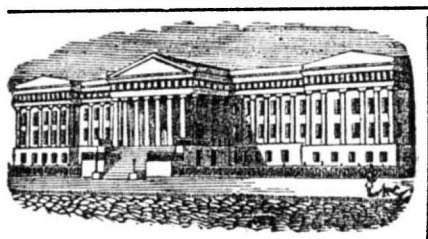

[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

### Issued from he United States Patent Office.

FOR THE WEEK ENDING MARCH 14, 1855.

SASH FASTENER—Wm. C. Arnold, of Rochester, N. Y. : I claim the arrangement of the bolt, B, traversing in guides, the slide, S, and the tumbler, T, in relation to the case and the notches, h, thereon, as set forth.

BOTTLE STOPPER FASTENINGS—T. A. Ashburner, of Philadelphia, Pa. : I am aware that many devices have been essayed for securing corks in bottles, but all of them involve expense, intricacy, or difficulties in placing or removing them from the bottle, and I do not claim any such contrivances, meaning to limit myself to what I have described and represented, relying mainly upon the hinging of the stirrups to the button, which greatly facilitates the placing or removing of the button from the cork, and securing the stirrups on one side to the neck of the bottle.

I claim the device described for securing corks in bottles, viz., a button provided with hinged stirrups for catching under the projection of the bottle, for the purpose of more readily placing it on, or removing it from the cork, and this I claim, whether said device is a fixture on the bottle, or separate therefrom, as described.

POLISHING APPARATUS FOR WATCHMAKERS' LATHES—J. M. Bottum, of New York City : I claim the application of the polishing spindle to the lathe in such a manner that it has a universal movement, substantially as described, for the purpose of adjusting the polishing wheel to surfaces of various forms.

[A brief description of this invention may be found on another page.]

MACHINES FOR TURNING, BORING, AND SLOTTING METALS—Alanson Brown, of Rochester, N. Y.: I am aware that single column machines for boring and drilling small work, have been used, in which operative parts project forward of said column, this I do not claim as the support is not firm enough for accurate work of the kind which my machine is devised for, and these I do not claim.

But I claim so arranging the table or face plate, and upper spindle or tool holder, on a machine for turning, boring, and cutting key seats, as that either one of the two may be revolved, and the other remain stationary, as the character of the work may require, and substantially in the manner set forth.

I also claim combining with the upper spindle, a revolving slide head carrying a cutter susceptible of either a horizontal or vertical motion, or adjustment, as set forth, for the purpose of turning off work either inside or outside, that will not revolve between the column.

I also claim arranging two, three, or more supporting columns, in rear of a plane drawn through the line of centers of the operative parts of the machine, for the purpose of leaving an unobstructed front for the introduction of the piece to be dressed, as described.

SELF-LOADING CARTS—Ze Butt, of Lincolnton, N. C. : I claim the manner described, or any other essentially the same, of constructing, arranging, combining, and operating cart bodies, so that they can be dropped to or upon the ground to receive the load, be loaded, as the cart moves forward, and then elevated and dumped or unloaded, the same as an ordinary cart, substantially as and for the purpose described.

[See a description of this self-loading cart on another page.]

EXCLUDING DIRT FROM GROOVED RAILROAD RAILS—C. M. Eakin, of West Philadelphia, Pa. : I claim the application of an elastic filling to the groove, which is formed in the track to receive the flanges of the wheels, substantially as and for the purposes set forth.

[A descriptive notice of this invention will be published in the next number of the SCI. AM.]

HOOP JACKS FOR SAILING VESSELS—Elmer Foster, of Fairton, N. J. : I claim the arrangement of the hoop jack with the lower halyard block, the brace line, clevis, and gaft hook, clevis and hoop line extending down to the foot of the mast and connected to each sail loop, as set forth.

CUT-OFF VALVES FOR STEAM ENGINES—Noble T. Greene, of Bridgeport, Conn. : I claim combining with the rocking levers, or their equivalents, for operating the valves, the spring tappets on the sliding bars, substantially as described and for the purpose specified.

I also claim, in combination with the sliding spring tappets, that operate the rock levers, substantially as described, the employment of the gauge bar, or any equivalent therefor, to regulate the period of closing the valve, whether the said gauge bar be regulated by a governor, or by other means, as set forth.

SEED PLANTERS—H. Ludington & S. R. Lupton, of Addison, Pa. : We claim the construction of an expanding sectional hopper, E E, hung by hinges or otherwise pendant, and formed with concaves on the inner sides, which concaves have formed thereon diagonally arranged ridges or sloping irregularities, a a a a a a, substantially as described.

Second, we claim the construction of a drum, cylinder, or roller, F F, with series of ridges or sloping irregularities, p p p, formed or arranged diagonally across its circumference or periphery, together with longitudinal troughs or gutters, s s s s, at intervals between the ridges as shown. This cylinder being also combined in action or operation with the hopper, E E, and the revolving spike shaft, H, as set forth.

Third, we are aware that there are such devices as tilting tables, dumping beds, and cart bodies, and sloping or sliding planes, for the purpose of precipitation, none of these, however, do we claim, as they are not equivalent forms of construction to ours, for they do not embrace the two fold principles of our device ; nor is it a fixed sieve, or permanently arranged grating that we claim, but instead, we claim constructing a feeding or supply fountain, having the combination of adjustable hinged frame grating, actuated by cords or equivalents, and to answer the two fold purpose of holding the compost mass, and preventing the escape of lumps, &c., and admitting also of being elevated or depressed, or thrown forward at pleasure, for the purpose of relieving the grating and hopper or fountain of lumps and other obstructions, in the manner and for the purpose set forth.

GAS REGULATORS—J. W. Hoard, of Providence, R. I.: I am aware that the inverted cup has been and is employed by Kidder, and others, and therefore I disclaim it, irrespectively of the peculiar arrangement and combination described.

I claim the arrangement of the inverted cup so that only the upper side or exterior is exposed to the pressure of the gas, and the under side or interior is exposed to the atmosphere, when this is combined with the application to the said cup of the air spring, f, or its equivalent, substantially as and for the purpose set forth.

[See further notice of this Gas Regulator on another page.]

SCREW WRENCHES—Joseph Hyde, of New York City : I claim the auxiliary jaw or gripper, E, applied to or inserted within either the stationary or movable jaw of a hand or screw wrench, said jaw or gripper being constructed and arranged as shown, or in an equivalent way, so as to bind or press the article between it and the stationary jaw, with a force proportionate to that exerted in turning the wrench, as set forth.

[A description of this invention will appear in next week's paper.]

MAKING PAPER BOXES—Louis Koch, of New York City : I claim, first, the application of a series of rollers connected together, and worked by an arrangement of levers and toes or cams, for the purpose of bringing paper from an endless roll and of a required length, into the machine, and pieces of paper previously shaped and pasted by the machine, to the place required, substantially as described.

Second, the application of a stamp frame with suitable knives or stamps attached, situated between the rollers for the purpose of cutting off the paper the required size and shape, from the endless roll, necessary for one box.

Thirdly, the application and construction of the pasting frame, with paste boxes situated between the rollers, and arranged in such a manner as to paste the already shaped paper, in the required places, as set forth.

Fourth, the construction and application of a wheel with arms, having at their extremity the molds attached around which the boxes are to be made said wheel with mold being moved by an arrangement of a rod and lever actuated by a cam in the manner described.

Fifth, the application and use of a series of slides for the purpose of folding the ends of the papers round the mold, said sildes being worked by a combination of levers, &c., actuated by toes in the manner set forth.

Sixth, the application and use of a pair of pincers, for the purpose of pulling the finished paper box off the mold, constructed and worked in the manner set forth.

Seventh, the construction of the outer mold formed by two projections attached to the frames, and a hinge valve ; and the operation and manner of working said valve ; the various parts of the whole machine being combined and arranged for the purpose described.

GRAIN CLEANER—George Leach, of Owego, N. Y. : I claim dressing or furrowing the stones by having the furrows or grooves, e f, cut in the face of the bed stone, B, and the furrows or grooves, g h, in the face of the runner, C, said furrows or grooves being of the form or shape, as shown and described, and for the purpose set forth.

[In next week's SCI. AMERICAN a further description of this improvement in Grain Cleaners will be published.]

SLEIGHS—W. W. Guiwits, of Rodgersville, N. Y. : I claim the combination of the sliding bolsters M1 M2, and friction rollers, H H, with the axle tree, C, and fixed bolsters, M, in the manner and for the purposes set forth,

I also claim the slots, R, in cross bar, V, which permit the movement of the forward runners, without any wrenching.

[See a description of this invention on another page.]

DITCHING MACHINE—E. C. Manck, of Harrisburg, Va. ; I claim the described mode of regulating the operation of the cutter or plow, by means of the swinging frame, F, connected with the body of the machine, substantially as specified in connection with the check plates, operating as and for the purposes set forth.

VALVES FOR GAS BURNERS—Andrew Mayer, of Philadelphia, Pa. : I claim fitting the valve cups, b b, to a tube, C, which forms a valve box in which all the cups and valves can be properly fitted without difficulty, and inserted conveniently in their place in the burner or into any chamber prepared to receive them, as fully described.

[A description of this improvement in gas burners may be found on page 380, Vol. 9, SCI. AM.]

EVAPORATING APPARATUS—James McCracken, of Bloomfield, N. J. : I claim the arrangement and use of a set of metallic cylinders containing vertical tubes, as described, in connection with the mode of conveying the escape steam from the pans to the condenser in the manner and for the purpose set forth.

OPERATING PUMPS BY WIND—Hiram Moore, of Charleston, Mich. : I claim the combination of a compensating cam and spring, or the equivalent thereof for operating a pump driven by a windmill, substantially in the manner and for the purpose set forth.

WASHING MACHINES—Elijah Morgan, of Morgantown, Va. : I claim suspending a reciprocating rubber, C, between the yielding bar, D, and washboard, B, in such manner that said washbonrd and bar may both have a vertical motion during the action of the rubber, and at the same time an expansive action or motion due to an over accumulation of the clothes between the rubber and washboard, as deseribed.

[See notice of this invention on another page ]

FIRE EXTINGUISHING COMPOSITIONS—E. F. Overdeer, of Chattanooga, Tenn. : I am aware that pearlash and other salts, either alone or mixed with other substances have been used to saturate or cover combustible articles to render them fire-proof. Therefore I do not claim the use of pearlash or saleratus for the purpose of preventing ignition, or rendering combustible articles fire-proof.

But I claim the employment of a solution of pearl ash in water in the proportion of 16 pounds of pearlash, or thereabout, to 100 gallons of water, as a substitute for water in extinguishing fires.

LAMPS—F. C. Rider, of Providence, R. I. : I claim the use of the regulator tube, H, arranged and operated as set forth, in combination with the wick and wick holder, as applied to the inner surface of the wick to regulate and control the flame of wick, substantially as set forth.

BRICK KILNS—Jesse Russell, of Elkton, Ky. : I claim the arranging of the fire chambers outside of the kiln and introducing the products of combustion to the brick to be burnt through avenues or passages extending from the fire chambers, entirely across the kiln, when said fires are placed and used on one side of the kiln only, substantially as desribed.

ORDNANCE—Christopher Wolter, of Bridgeport, Conn. : First, though I do not claim of itself the mounting of a gun barrel or piece of ordnance upon a universal joint or pivot. I claim the connection of two barrels or pieces thus mounted, in such a manner that they may be adjusted and held at any desirable angle relatively to each other, substantially as and for the purposes described.

Second, I claim the connection of the barrels by means of the toggle joints, j j, and the central slider, F, working in a suitable slide supported by the carriage, substantially as described, for the purpose of adjusting the barrels at the desired angle.

Third, supporting the breeches for the purpose of varying the elevation of the barrels by means of a frame composed of sectors, D D D D, and slotted heads, C C, attached thereto, as described, whereby the necessary changes of elevation and of the angle of the two barrels are provided for independently of each other ; this I claim, irrespective of any mechanical devices that may be employed to raise and lower the frame.

Fourth, the connection of the two hammers or the triggers or their equivalents by means of two links with a sliding piece, v, operated upon by a cord or chain connected with a rod, r, which passes through the side of the carriage and has a spring, s, applied substantially as and for the purpose set forth.

Fifth, connecting the cord or chain with the rod, r, or its equivalent, by merely passing it through an eye at the end thereof, and attaching it to a winch, w, conveniently situated to keep it always wound up to the proper degree to give it the required length, as fully set forth.

[This invention is recommended to Lord Raglan for the use of the Allies in the Crimea. A description of it will be published next week.

SAFETY FERRY BRIDGE—Henry Lawrence, of New York York City ; I claim the employment of the reciprocating carriage, G, the suspended central gate, B, and side gates, C C', the whole being arranged essentially as shown, and operated by the boat and weights, substantially, as and for the purposes set forth.

I also claim making the side gates of a circular form instead of flat so that in case drunken or thoughtless men lay hold of them or get in a position to interfere with their being opened freely, they shall, as they open have a tendency to throw them off instead of forcing them up against the railings, and crushing them, substantially, as set forth.

[This is a life-saving apparatus, and a description of it will be published in the same number of the SCI. AM. in which the "Killer" improved ordnance above, appears.]

CURTAIN ROLLERS—F. W. Urann, of Saxonville, Mass. : I do not claim the insertion of the end or journal of the curtain roller in a chamber or bearing in the socket that supports it.

But I claim extending the pulley head into the bracket substantially in manner, as described, and for the purpose of protecting the cord of the pulley from getting between the said head, and the bracket during the process of rolling up or unrolling the curtain.

STUMP MACHINES—Edward Vaughn, of Alliance, O. : I claim the arch beams, d d, the brace posts, l l, in combination with the incline braces, c2 c2, and horizontal beams, a, making a new and useful, firm, and compact frame, as set forth.

Also the combination of a half sphere, and groove, i, forming a new half spherical washer, g.

Also the combination of the groove, k, opening, j, with a square recess, m, for the purpose as set forth.

Also for the purpose of attaching and detaching the trucks, H H, to and from sills, c, by the combination of levers, h h, fulcrums, r r, joints, q q, posts, t t, dogs, v, and levers, I, as set forth.

Also the securing of the bar, K, to the hounds, J J, as set forth.

I do not claim any one separate thing in the above mentioned invention : but I claim the combination as set forth.

[See description of this invention in No. 10 present volume SCI. AM.

DOOR LOCKS—Wm. Warwick, of Birmingham, Pa. : I claim so forming the tumbler with beveled edges for the key to operate it, and so arranging it in relation to the bolt and the stud, z, that when locked, the bolt is held firm against pressure, by the tumbler fitting over the stud, z, as set forth.

EAVES GUTTERS OF HOUSES—G. W. Wheatly, of Harrodsburgh, Ky. : I claim the application of a bead or molding, together with with the strop to gutters of the description above, giving strength to the gutter without the aid of a plank or other substance.

BREECH-LOADING FIRE ARMS—Rollin White, of Hartford, Ct. : I claim the connection of the breech with the hammer, in such a manner that it may be withdrawn to open the chamber to receive the charge by the act of cocking the hammer, and replaced to close the chamber by the falling of the hammer when the latter is set free to explode the charge, substantially as set forth.

BREECH-LOADING FIRE ARMS—Rollin White, of Hartford, Conn. : I claim, first, the connection of the breech or breech piece, with the hammer in such a manner that the latter may be cocked by the act of moving the former into its place to close the chamber, substantially as set forth.

Second, the peculiar manner of effecting the cocking and setting force of the hammer by means of the spring tooth D, attached to the breech or breech piece and the sliding piece, d, working in the tumbler to be acted upon by the trigger for the purpose of disengaging the said tooth, substantially as set forth.

Third, the employment of a crank or eccentric, f, arranged and operating substantially as described, for the purpose of disengaging the tooth D, from the tumbler, and thereby disconnecting the hammer from the breech or breech piece, when the immediate repetition of the discharge is not desired.

[The above patents granted to Mr. White are important improvements, but cannot be well described without engravings. Mr. W. has several other inventions in the same line, on which patents will soon issue.]

PROCESSES OF CURING MEATS—J. C. Schooley, of Cincinnati, O : I claim the process of curing meat and preserving fruit and provisions by means of circulating currents of air artificially dried by ice, or its equivalent through the room wherein the curing takes place, substantially as and for the purposes set forth.

MANUFACTURE OF STONE PASTEBOARDS—James Smith, of Mendon, N. Y. : I do not claim the use of bole of any kind, or chalk of any kind, or Spanish white, or glue, or paper pulp, or linseed oil, either separately or the wh le combined, nor do I in any manner use bole, chalk spanish white, or glue, or a compound of which they form a part.

But I claim sheets for roofing, boarding, and other purposes, made or constructed in the manner described or other equivalent manner by combining said stone when pulverized with paper pulp.

I also claim the application of and combining drying oil with said pulverized stone and paper pulp, combined in sheets as aforesaid, in the manner described, or in any other equivalent manner, so as to produce the results specified, or others substantially the same.

MACHINERY FOR SPINNING WOOL—F. S. Stoddard, of Litchfield, Conn. : I claim, first, conducting the roving from the back to the front drawing rollers, by employing a bridge or rest, with fingers upon it situated between the front and back pairs of drawing rollers, for the purpose of governing the course twist so as to adapt a smaller portion of it to the part of the thread nearest the back rollers

Second, impeding the ring travelers while winding upon the lower or larger parts of the cones by means of a series of brushes, q q, or their equivalents, operating substantially as set forth, so as to gradually set the traveler free as the winding approaches the smaller or upper ends of the cones, thereby producing a uniform tension on the thread while winding.

[Mr. Stoddard's invention will be described, as well as it can be without engravings, in next week's SCI. AM.]

AIR HEATING FURNACE—J. H. Sutton, of Honesdale, Pa. I claim the arrangement of the furnaces, A B, the descending smoke pipes, g z, and the central smoke pipe, C, with each other and with the single air-heating chamber, D, substantially in the manner and for the purpose set forth.

[See notice of this Furnace on another page.]

APPARATUS FOR OPERATING VENTILATORS—I. P. Trimble, of Livingston, N. Y.—I do not claim effecting the ventilation of buildings, &c., by operating the valves to the vents or air passages by the force derived from the expansion of metal as this has been before proposed.

But I claim having the valves or ventilating doors connected to the said metal bands, about midway between their fixed supports, so that the varying degrees of flexure shall effect the operation of opening or closing said doors in the manner and for the purpose described and shown.

BENZOLE VAPOR APPARATUS—Charles Cunningham, of Nashua, N. H., (assignor to Jno. C. Pedrick) of Boston, Mass. : I claim first, the combination of the heater, w, and the swinging gas burner, v, or of the induction air pipe, A, and any one of the burners of the apparatus, with the water vessel, n, the reservoir, k, or the meter, a, substantially as herein described for the purpose of keeping the contents of the vessel containing the benzole or light-producing liquid at a given temperature.

Second, the combination of the reservoir, k, and the rotary disseminator, n o, with an ordinary rotary meter wheel, substantially as described for forcing air through the hollow shaft or its equivalent, into the reservoir, k, for the purpose of vaporizing the benzole of the latter vessel

Third, the peculiar mode of making the rotary disseminator, n o, substantially as described, and for the purposes specified, not meaning to claim the use of the hollow shaft for evaporating saccharine fluids.

Fourth, the application and use of the meter wheel with its case and connections as an air blast apparatus, operated by weights or otherwise, not meaning to claim the method of using the mete. for measuring gas.

CULTIVATORS—S. A Knox, (assignor to Ruggles, Nourse Mason & Co.) of Worcester Mass. : I do not claim combining a curved and pointed knife with a common land plow, when said knife is placed against or very near to the nose of the plow, my employment of the knife or tooth on the horse hoe being in a different manner and for a different purpose from its use on a plow.

But what I claim is arranging the curved knife or pointed tooth, K, at or near the front end of the beam of the horse hoe, while the main or double hoe, C, is disposed at or near the rear end of the beam, and so as to enable the said tooth to be used in the manner and for the purposes as stated, it being employed in a common plow, simply for cutting the sod or opening it for the reception of the nose of the plow.

RE ISSUES.

DESIGN FOR METALLIC COFFINS—Martin H Crane, assignor to Crane, Breed, & Co. of Cincinnati, O., patented June 23 1855 : We claim the ornamental polygonal design for a metallic case or coffin, substantially as described and represented.

MACHINERY FOR SEPARATING FLOUR FROM BRAN—Issachar Frost and Jas. Monroe of Canton, Mich. patented Feb 27 1849 : We do not mean to claim to be the original inventor of a cylinder, nor of a cylinder covered with punched strips of sheet iron and strips of leather, filled with sacks such as are used in smut machines, nor the gearing by which the machine is propelled.

But we claim, first, The platform D, (always at right angles with the sides of the box when in a inside conical) or close horizontal bottom when used in connection with upright, stationary or revolving bolt for flouring purposes.

Second, the opening at D5 for the admission of a counter current of air through the bottom and into the bolt, and the opening and bran spout, F, as described in combination with the platform, D.

Third, The upright stationary bolt, or bolt and scourer combined with its closed-up top, exterior and material, or in combination with claims, first, second, and fourth, or either of them, or their equivalents, to produce like results in the flouring process.

Fourth, The use of the revolving, distributing scouring, and blowing cylinder of beaters and lags, by which the material is distributed, scoured, and the flour blown through the meshes of the bolting cloth.

[No less than *sixteen* of the patents in the above list were prepared at the SCIENTIFIC AMERICAN Office. Advice concerning patent matters is cheerfully given, orally, or by letter, without charge, upon application to this office. Circulars of information mailed upon application addressed to Munn & Co., SCIENTIFIC AMERICAN Office, New York City. See advertisement on advertising page.]

### The New Postage Law—Important to the Public.

The Post Office Department calls attention of Postmasters and the public, to the new postage law, requiring that all letters between places in the United States shall be pre-paid from and after the 1st of April, 1855, by stamps or otherwise, and that from and after the first of January next, Postmasters must place postage stamps upon all pre-paid letters upon which such stamps may not have been placed by the writers, or which may not be inclosed in stamped envelopes. From and after the first of April, 1855, the postage to be charged on each single letter for any distance in the United States not exceeding 3,000 miles, is three cents, and over 3,000 miles, ten cents. The law does not change the existing rates or regulations in regard to letters to or from Canada or other foreign countries, nor does it affect the franking privilege. The provisions in regard to the registration of valuable letters will be carried into effect, and special instructions issued to Postmasters on the subject, as soon as the necessary blanks can be prepared and distributed.

### Fall of Black Snow.

Prof. Fairchild, of Oberlin, Ohio, states that on February 7th, they had in that region a fall of dark-colored snow. The crystals were in the form of dense icy pellets, about the twentieth of an inch in diameter. It fell to the depth of nearly an inch, and when melted it yielded about a half inch of water. The snow had a distinct smoky taste, and on filtering it through paper a dark, sooty substance was obtained.

### Chalk.

A specimen of this calcareous earth was shown us this week by A. G. Lawrence, Esq., of Campo Seco. It forms the base of a hill in that vicinity, the surface of which is a volcanic drift, containing a very rich gold deposit—which pays from $3 to $10 a cart load. The chalk hill has not been penetrated to any considerable depth, but it is likely that underneath this deposit, gold will be found. A curious phenomenon may be observed at this hill—one part of it is composed of chalk, while the other is the usual red clay formation, the line of demarkation being plainly visible.—[California Chronicle.

### Fire-Proof Floors.

If builders filled up the spaces between every wall and flooring with sea sand, no fire could communicate from one apartment to another. The staircases, if constructed of iron, on the geometrical principle, would prove non-conductors, space would be economized, and the chamber enlarged. Balconies running from house to house on every floor, are the most desirable of all fire escapes.

### To Kill Ants.

A correspondent writing to us states that if boxes were put round the ant hills in Texas, and toads put into them, the latter will soon destroy the ants, unless Texas toads are different from those in New York. One toad, he says, will destroy a nest of northern black ants in one or two nights. We rather think that the Texas ants are not so easily managed as our northern kind. They are more numerous, stronger, and bolder marauders.

### Saw Filing Machine.

The Bangor *Whig* (Me.,) speaks very highly of the patent saw filing machine of Thomas M. Chapman, of that place. It states, that it does the work of three men, and files every tooth true and smooth, and in the course of one season saves the price of itself in mill files used in a saw mill.

The railway between Alexandria and Grand Cairo, in Egypt, a distance of 130 miles, is nearly completed. There is a tubular bridge on it over the Nile.

The distress in England has been very great during the past winter, owing to the severe frost, by which the rivers and canals were all frozen for some weeks.

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## TO CORRESPONDENTS.

G. W. M., of Nova Scotia—We answer yes to all of your inquiries in regard to zinc paint; the job will be better if you use the zinc for both coats.

W. R., of Fla.—We think you cannot obtain a patent, no matter how well you sustained the vessel; if, however, you desire to make application we shall be happy to conduct your case, and you may send on the model.

B. M. F., of Pa.—We do not know how you will be able to obtain the plant you name; we cannot judge of the novelty of your churn without seeing a sketch or model.

W. R. Y., of N. Y.—Hodge's work on the steam engine will probably suit you: write to D. Appleton & Co., N. Y., for the same.

G. U., Jr., of Ill.—Your suggestions in regard to fire alarms are entirely original so far as we can judge, but we think you will meet with some difficulties in carrying them out. What think ye upon this point? we cannot state the price of an engraving of the lubricating apparatus until we can see one or a sketch, so as to judge how large a one is necessary. Send us the drawing as you wish it executed, and we will give it attention.

A. T., of Mich.—You know there is a great difference in the quality of logwood you purchase. You can easily try whether your ink is too strong or not by diluting it with water. A pound of good logwood is sufficient for one gallon of water. The bichromate of potash is chrome.

J. P., of Ark.—We think if you would confine your iron in a metallic box, with horse manure, and keep it hot for several hours, that you would soften your metal more thoroughly.

J. A., of Wis.—We have heard of the oil of rhodium attracting rats, but we really have no personal knowledge of the matter. The silvering of looking-glasses is a very important and intricate business. You can patch on a piece of silver leaf, with a very thin gum water.

R. J., of Va.—The cost of a cistern to hold one hundred hogsheads of water depends on the locality, for the price of brick, cement, and labor, are not uniform; inquire of a mason in your neighborhood; we cannot tell you how many artesian wells there are on the eastern coast of the United States.

G. L. B., of Texas—We cannot answer you about the difference of resistance in the conical and globe bullet of the same diameter.

E. F. R., of Mich.—White lead is a carbonate; red lead is an oxyd; the white is the best for joints.

J. W. L., of Ohio—A machine for binding grain has been patented, but never we believe put in operation.

C. F., of Tenn.—R. D. Granger, No. 145, Second street, Philadelphia, Pa., is the patentee of the "Iren Witch" stove.

L. W. G., of N. Y.—There is a "School of Design" for women in this city; the only one we know of

D. N., of Ill.—The amount of lap is regulated by the stroke of the valve itself; if you consult Bourne's Catechism on the Steam Engine, you will get the information on pages 72 and a table on page 277; the work is sold by Appleton & Co., this city, for one dollar; your engine is quite a large one.

C. W. G., of Ct.—Your scale is new to us and we think patentable.

D. M. B., of Ky.—We are informed by Andrew Dennison, of Brunswick, Me., that he can supply machines for making ointment boxes.

F. C. M. The tree felling machine which you describe strikes us as being new and patentable. If it will work as well as you say, it would be a very valuable invention.

S. & B., of Ct.—Your spoke tenoning appears to be new and patentable.

W. H. C., of N. Y.—Filmer & Co., of 128 Fulton street, over the Sci. Am. office, will electrotype anything you desire, in the best manner.

H. C., of Fla.—Your scale hat is one of the greatest novelties of the day; should think it a first rate article to hunt alligators; no doubt of its patentability. $2 received; all right.

W. S., of Ind.—Your Letters Patent came duly, and the engravings are being executed and will soon be published.

M. B. T. & Co., of N. Y.—Your letter of the 11th, covering $15, came duly to hand, and has been disbursed agreeably to your instructions.

F. B. S., and T. R., of Vt.—Your platform scale is new to us, and we think a patent could be secured. We know of no patent on the sliding poise you speak of.

D. G. F., of Miss.—In Number 32, Volume 1, of the Scientific American, you will see an engraving for kyanizing timber, but we do not know that it has ever been in use.

Q. W. C., of Wis.—The Practical Draughtsman's book will answer your purpose as a self-instructor. $2 received all right.

J. H., of N. Y.—You had better get a book on the steam engine, and work out the problem at your leisure.

L. W. A., of Mass.—Such an alarm as you suggest would be useful on every sailing and steam vessel, and for every light house or marine station. You can apply for a patent through us.

J. G., of Ohio—We shall be glad to get your papers on the management of circular saws. Your plan of obtaining power from falling trees, to saw down the standing timber, is certainly very novel, but we question the possibility of its operation.

W. M., of Pa.—We cannot refer you to any other work for a more minute description of Professor P's. engine.

A. C., of Ct.—No gain can be expected from using the products of combustion in combination with steam, for a motive power, or singly by themselves.

R. O., of N. Y.—We have never tried to make the ink to which you refer, but it appears to be made of logwood and the bichromate of potash. Take a pound of the extract of logwood, dissolve it in warm water, and add one ounce of the bichromate of potash.

J. G., of ——Yours will receive attention.

J. S. Hix, of Lawrence, S. C.—Requests information respecting muley saw mills, and the best builders of them.

J. H., of Ill.—McCormick did not serve an injunction on Seymour and Morgan's patent. McCormick's patent to which you refer, will expire in 1859. You cannot use the parts claimed by Morgan & Seymour, nor the parts claimed by McCormick.

W. L. H., of L. I.—We do not know the price of slate for roofing, but they can be found at any of the slaters' shops in this city. It requires a workman to lay them properly.

W. T. S., of Fla.—We do not know any composition to make a chimney equal to bricks, which is cheaper. If you have lime and small stones at hand, you can build a good chimney with them—one nearly as good as brick.

A. J. C., of La.—We believe there are patentable features in your lock.

F. S., of Ct.—We cannot form any idea of the patentability of your railroad signal without knowing something of its construction.

C. B. B.—Your method of using water in a cylinder is old, and could not be patented. It possesses no advantage over the ordinary water wheel.

H. H. T., of Mass.—How do you manage your boiler? We have never heard of the copper float in the hydrostat becoming filled with water. Copper will not be penetrated with the water.

D. P., of N. Y.—The book on the Steam Engine, by the "Artizan London Club," is a good one; the price is about eight dollars. Minifie's book on drawing would be the best for you to commence with. Price $3.

E. A. D., of N. Y.—Mercury cannot of course indicate the temperature when it freezes. Alcohol thermometers are used for the low temperatures.

J. F. O., of Athens—If we published your letter, we would simply answer it by calling upon you for proof. If spirit is matter, then you are bound to tell us what is its composition, and to give some analysis of what it is. Our chief objection to the insertion of your letter is, that it would call out a deluge of communications, for which we shall be urged to give space—but could not comply.

J. G., of Canada West—An apparatus for lifting locomotives and placing them on the track, substantially the same as yours, was patented here Feb. 6th, 1855, by Messrs. Powers & Carpenter, of this city. It is an excellent apparatus. The best, for the purpose, with which we are acquainted.

J. McM., of Ky.—Your model has come to hand, and your application will be taken up in its turn for preparation—probably within two weeks—and sent for your execution.

T. M. B., of O.—Use ivory black and well boiled oil, for making the best black paint for iron. When dry, varnish it; and rub down in the usual method of polishing wood.

W. W. H., of Va.—Your arrangement for railroad axles on curves is not new.

F. H., of Mass.—Testing the validity of patents is rather out of our line. Your communication could go in as an advertisement at 25 cents a line. Presume it would bring the desired information, if it is to be had.

J. B., of La.—We do not believe your hour-glass time piece could be patented. Neither do we see any advantage from its use.

W. R. B., of N. Y.—Your inhaler resembles in principle the apparatus employed for centuries by the Orientals in smoking tobacco, to draw the smoke through perfumed waters. It is not patentable.

S. W. S., of N. C.—The sketch of your buggy and improved spindle is received, and so far as we can judge from the evidences before us, you have made a fine improvement. A circular of information we have sent you. $2 placed to your credit on account of subscription.

Money received on account of Patent Office business for the week ending Saturday, March 17:—

D. T., of N. Y., $30; T. L. S., of N. Y., $100; L. C., of Miss., $55; J. T., of Ct., $30; E. G., of Vt., $25; C. D. R., of Wis., $25; F. & P., of Pa., $30; F. & McC., of Pa., $25; J. J. D., of Ct., $30; J. E., of Mass., $30; D. A. H., of N. Y., $30; G. B. S., of Ct., $30; J. B. S., of Ct., $30; J. H. K., of N. Y., $25; P. L., of Mich., $25; J. C. A., of Md., $50; M. B., of Ind., $40; C. A. N., of Mass., $25; J. H. G., of O., $25; H. W. O., of Ct., $25; J. M., Jr., of N. Y., $30; E. K. R., of N. Y., $30; C. J. F., of O., $25; J. D., of Pa., $10; J. D B., of N. Y., $30; K. K., of N. Y., $30; H. B. L., of O., $25; J. S. T., of L. I., $20; S. D., of ——$10; S. W., of Mass., $25; J. H. T., of N. J., $30; G. K., of Va., $30; J. S. T., of Pa., $30; J. G., of R. I., $20; J. R., of N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 17:

D. T., of N. Y.; J. R., of N. Y. (2 cases); J. B. S., of Ct.; R. A. N., of Tenn.; J. E., of Mass.; J. J. D., of Ct.; E. G., of Vt.; J. J. S., of N. Y.; P. L., of Mich.; C. J. F., of O.; H. W. O., of Ct.; D. A. H., of N. Y.; C. A. N., of Mass.; F. & McC., of Pa.; C & C. D., of Sardinia; S. W., of Mass.; H. B. L., of O.; S. R., of Pa.; J. J. T., of Pa.; J. G., of R. I.; G. C. B., of O.

### Important Items.

Patent Laws, and Guide to Inventors—Congress having adjourned without enacting any new laws pertaining to applications for patents, we have issued a new edition of the old laws, which may be had at our counter or sent by mail. This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12½ cents per copy.

Back Numbers and Volumes—We have the following num bers and volumes of the Scientific American, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75. Of Vol. 10, all the back numbers.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.


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## American and Foreign Patent Agency.

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In addition to the advantages which the long experience and great success of our firm in obtaining patsent present to inventors, they are informed that all inventions patented through our establishment, are noticed *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week and enjoys a very wide spread and substantial influence. Parties intrusting their business in our hands can rely upon prompt and faithful attention.—Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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28 2eow* Florence, Hampshire Co., Mass.

**JOHN PARSHLEY**—Nos. 5 and 7 Howard street, New Haven, Conn., is now ready to furnish at short notice, Engine Lathes for shafting of 2-3 inches swing, 16, 18, and 20 feet beds, 12½, 14½, and 16½ feet between centers; also Engine Lathes of 38 inch swing 14, 17, 20 and 25 feet beds, and 9, 12, 15, and 20 feet between centers. Circulars, with cuts and all required information can be had by addressing as above, post paid. 28tf

**THE GREAT PARIS EXHIBITION, 1855.**—MESSRS. GARDISSAL & CO., No. 44 Rue de Marais—Have the pleasure to announce to the manufacturers and artizans of the United States that they have opened an office at the above named place, for the purpose of taking charge of goods and machinery, and superintend all requisite details for the Great French Exhibition, effecting sales of goods, machinery, patents, &c. They will also attend personally to the purchase of any article of French manufacture, useful or ornamental, with care, and at a low price. MESSRS. GARDISSAL & CO. are also publishers of THE INVENTION, a monthly journal devoted to the ARTS, SCIENCE and MECHANICS and are desirous to publish in its columns engravings of American inventions patented in France, and also such machines as are placed on exhibition.—They offer this excellent facility upon such terms as will meet the favor of all. Patentees who desire to sell their French patents can consult with Messrs. Gardissal & Co, and employ their agency for that purpose. They would also state, that it will be of the utmost importance to American exhibitors that their articles should be carefully attended to, and their advantages explained during the Exhibition. This will conduce to their success, and tend very much towards sustaining the well-earned reputation of American genius for useful and practical inventions. Messrs. Gardissal & Co. refer by permission to Messrs. Munn & Co., Scientific American Office, New York. S. H. Wales Esq., New York State Commissioner to the French Exhibition.

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# Science and Art.

### Percussion or Fulminating Powder.

If the word "diabolical" can be properly applied to any substance that chemical artifice has produced, it certainly belongs to this, which, from the terrific power and force of its explosion, truly deserves that title.—The extraordinary power of fulminating mercury, or, as it is commonly termed, percussion powder, prohibits its use as a projectile, because we have not yet made any cannon capable of withstanding its force, if fired in any quantity at once. Sufficient to project a ball or a bomb-shell would completely shatter a cannon on the instant of explosion. It is a strange mixture that produces fulminating powder—such a combination as none but a true chemist would think of making. Fulminate is prepared with nitric acid (extracted from saltpetre,) alcohol (that is, spirits of wine,) and mercury. These substances are the representatives of the atmospheric, the botanic, and mineral portions of the world; and although they are here united, they have but little affinity to each other, and are only waiting to fly asunder at the slightest call. The fall of a feather upon pure fulminating powder will sometimes cause it to explode. We would describe the method of its manufacture did we not fear to do so, lest some of our ingenious readers should attempt to produce it. None but persons of the greatest experience should ever touch it. Not long ago the principal operative at Apothecaries' Hall, a man extremely cautious, and of profound experience, was shivered to pieces while drying an ounce of it. As a means of igniting gunpowder, it has proved in warfare of great service, as it adds to the force of the powder. Eight and a half parts of powder fired with percussion caps, are quite equal in force to ten parts of gunpowder, fired in the old way by means of the "pan and flint." One ounce of fulminate is more than enough for charging a thousand caps. In charging the caps, the fulminate is mixed with a quarter of its weight of water and half its weight of gunpowder; the whole is then ground together with a wooden muller upon a marble slab. Percussion powder, like gunpowder, owes its terrific force to the concentration into a solid form of the elements of air in the immediate juxtaposition of combustible materials, which, when fired, assume instantaneously the air shape and bulk, which is, by the heat developed at the instant of explosion, fearfully increased in size. All substances that contain a great deal of oxygen will "explode more or less when in contact with combustibles, although not included in the category of warlike stores." Thus, at Gateshead, during the late fire there, dreadful explosions took place, although no gunpowder was present. Some of the warehouses contained vast quantities of nitrate of soda, a substance of similar compositon to nitrate of potash (saltpetre). The naptha and the sulphur being mixed with this, formed a compound precisely similar to, although not identical with, gunpowder. Chemists are, however, acquainted with many substances far more explosive than fulminate, such as chloride of nitrogen, a pound of which would annihilate the strongest fort in the world. By the time the chemists have taught us to control this frightful power, let us hope that the peace of nations will have rendered it useless.

SEPTIMUS PIESSE.

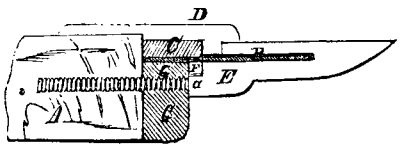
London.

### Warming Cities.

A French journal, *L'Amides Sciences*, points out to speculators an invention, for which he gives credit to the Americans. It is proposed, they say, to found a city in the United States with the streets warmed from below, so that the snow shall melt as soon as it touches the soil, the rain will evaporate, and the inhabitants will always enjoy a mild temperature. The method to be employed consists in carrying the smoke of all the chimneys into the drains, from which it will pass to a great hollow pyramid, erected without the city, and its motion upward will be excited by a powerful steam engine. Though the editor of the *Amides Sciences* calls this a Yankee project, he states at the same time that the remarkable idea of it was first started by a Mr. Jobard, of Brussels; but in this he is mistaken, as we are acquainted with its author, and it was proposed to us about ten years ago.

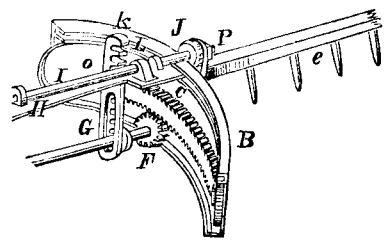
### History of Reaping Machines.—No. 24

Fig. 49.




On the 21st Jan., 1854, Aaron Palmer, of Brockport, N. Y., and S. G. Williams, of Janesville, Wis., obtained a patent embracing two claims relating to the rake and the reel. One for the means of moving the rake on the platform by a double curved rack and pinion on the driving wheel axle. Also a method of hanging the reel to dispense with a post or reel bearer next to the standing grain, (see page 163, Vol. 9, Sci. Am.) We notice this claim in its regular order, according to date, but are preparing some engravings to better illustrate the invention, which we shall publish in a week or two. On page 203 same volume, is the claim of the patent issued to Solyman Bell, of Marseilles, Ill., on the 28th of February, 1854, which has for its object the prevention of clogging the cutter, as shown in this section view through the guard, fig. 49. E is the guard, made with a screw shank, to pass into the bar, G. *a* is a recess in the guard; the bar, G, forms one side of this recess or score. B is the sickle; there are zig-zag teeth rivetted to the bar, C. A is the stock and D is a bracket fastened to the stock, and the sickle is traversed in the usual manner. A series of pins, F, are placed on the underside of the cutter, so that when the sickle is moved back and forth they will remove any leaves or stalks in the recesses or scores, *a*, and thus prevent choking. The claim is for the pins in combination with the recesses or scores, *a*, in the guards, to remove any leaves, &c.

Fig. 50.




On page 249, same Vol. Sci. Am., are two claims of a patent granted March 14th, to Daniel S. Middlekauf, of Hagerstown, Md., for a rotary cutter, embracing the rotary cutters with their edges passing one another; also the combination of the reel and an apron for supporting the grain in an inclined position. On the 21st of the same month, a patent was issued (dated Sept. 21st, 1853,) to Henry Green, of Ottawa, Ill., embracing three claims; one for having the back of the sickle shaped zig-zag, the angle of which presses back the substances which collect upon the fingers, to prevent choking. Second, extending the rear ends of the sickle teeth behind the sickle bar, and having them sharpened to cut off st lks, &c., that might collect on the fingers. Third, terminating the sickle stock at the inside of the rail, and fastening them together, so as to permit the sickle and stock to travel near the ground, and parallel with it, while the back of the carriage is so high as to clear the grass or grain of the previous swath, (see claims page 227, Vol. 9, Sci. Am.) On the same page is the claim of the patent granted to P. H. Kells, of Hudson, N. Y., for a method of hanging the cutter bar to make it conform to the surface of uneven ground. On March 28th, 1854, a patent was granted to B. G Fitzhugh, of Frederick, Md., embracing four claims, relating to the improvement of the blade in the fingers; a curved reciprocating knife, fingers, and platform; a reel with curved beaters, and a revolving reel, with a revolving sweep rake, to dispose the grain upon the platform with its stalks converging to the axis of the rake, (see page 235, Vol. 9, Sci. Am.) On the same page is the claim for a patent granted to J. Cook, of Enon, Ohio, for a device to force the unbound grain from the table, in combination with an arm at the end of the reel and apron, to carry the grain from the platform to a receiving table, and then deposit it on the ground in bunches for binding. On the same page are two claims of a patent granted to Wm. H. Seymour, of Brockport, N. Y., and relates principally to mechanism for traversing, raising, lowering, and holding the rake, as shown in fig. 50, where the rake is represented by *e*. The operating mechanism consists of an endless rack, C, arranged on a curve whose center coincides with the swivelling center of an universal joint at the extremity of the shaft of pinion F. The pinion is held in gear with the rack by means of a stirrup, G, which permits the pinion shaft to rise and fall so as to pass above and below the rack alternately. The stirrup, G, is pendant from a vibrating arm, H, the outer end of which is supported by the run guard. The arm, H, carries a shaft, I, which is supported in suitable bearings, as shown. On the outer end of arm I, another arm, J, is attached, to which the rake, *e*, is secured. If this arm, J, is raised, the rake teeth are also elevated and held in a horizontal position, suitable for carrying them forward over the grain, when, by depressing the arm, the rake teeth are also brought down into a vertical position, and engage with the stalks of grain, carrying them off the platform. While the pinion, F, is above the rack, the rake teeth are elevated and running forward; but while the pinion is below the rack, the rake is depressed and running back. When the pinion is in the act of passing the end of the rack, in descending from the upper to the lower side thereof, the rake teeth are turned down, but when the pinion ascends again the teeth are raised. A rack, *k*, is mounted on the outer end of the pinion shaft; the upper end of this rack passes through an opening, *o*, in the arm, H, in such a manner that rack *k* will be carried up and down, but not turned, by the pinion shaft. Rack *k* gears with a toothed quadrant, L, on shaft, I, so that as the rack rises the quadrant turns upward, and elevates arm J, and with it rake *e*; while, as the rack descends, the quadrant is turned down and the rake is depressed. On the 18th of April, same year, a patent was granted to Martin Hallenbeck, of Albany, N. Y., embracing improvements in the fingers to prevent the sickle from clogging, (see page 259, Vol. 9 Sci. Am.) On same page is a claim for a corn harvester granted to Wm. Lapham, of Salem, Ohio.

### Who Invented the Zig-zag Sickle.

Messrs. Editors—On the 2nd inst. I had an interview with Hiram Moore, the gentleman who invented the zig-zag sickle. He assured me that he was the inventor in fact, and a gentleman here assures me he has a letter from Mr. Leland, recognizing Mr. Moore as the inventor. The question may now be considered settled, and the only regret is that it was not put into general use, and that the inventor did not receive his reward, and the public the benefit of it. The zig-zag sickle then was invented 17 or 18 years ago, since which time five or six persons have claimed to have invented the same thing.

HENRY GREEN.

Washington, March 6th, 1855.

### The Fair of the Metropolitan Mechanics Institute.

This Fair in Washington does not appear to have made a very respectable appearance this year. The Washington *Sentinel* speaking of it, says:—

"It is said that over two thousand free season tickets were issued to as many depositors. No matter how trifling the offering, it was accepted; but little or no regard being paid to its beauty, utility, or the degree of ingenuity which was necessary for its manufacture. As to the articles called 'tidies,' they were too numerous for open display, and therefore the directors strung them like fish, and hung the bunches at the window frames. Even an old calico shoe-bag found a place in the picture gallery! where Professor Whitaker was permitted to rear a cracked plaster of Paris cast of a statue of Venus. To say the least, it is shabby, and should have had, ere this, a coat of white wash, though we should not recommend the addition of a skirt. Perhaps the display of the earthy figure was meant as a burlesque on the fine arts! If so, we have nothing more to say."

### To Cure Felons.

J. V. Elliot, of Boston, assures us that it is better to steep the felon finger in a hot lye of wood ashes, than in water alone; he cured one on his finger without lancing, in this manner. The pain ceased entirely after soaking the finger for fifteen minutes.

### Wire Fence.

The *Plow, Loom, and Anvil* speaks of a machine being invented by J. Nesbitt, of Lowell, Mass., which can make netting wire fence at from seventy-five cents to two dollars per rod. At such prices this fence, if good, should meet with a most extensive sale.

### The Charleston Artesian Well.

This well, the deepest in our country, which continued for some time to pour out its water at the rate of 30 gallons per minute, has ceased flowing. Whether the underground supply has fallen short, or something has choked up the bore, we have not yet heard.

### LITERARY NOTICES.

Mining Magazine—The last number of this magazine, published by W. J. Tenny, No. 98 Broadway, this city, contains a number of excellent articles, as it always does. There is an interesting one on the Salt and Gypsum of the Preston Valley, Va., by Prof. Rogers; and another by Prof. Rankin, on the semi-bituminous coal of the Cumberland basin.

Geographical and Commercial Gazette—The March number of this very excellent and useful publication, by J. Disturnell, 207 Broadway, this city, is illustrated with a good map of Oregon and Washington Territories.

## Inventors, and Manufacturers

The Tenth Volume of the Scientific American commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

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